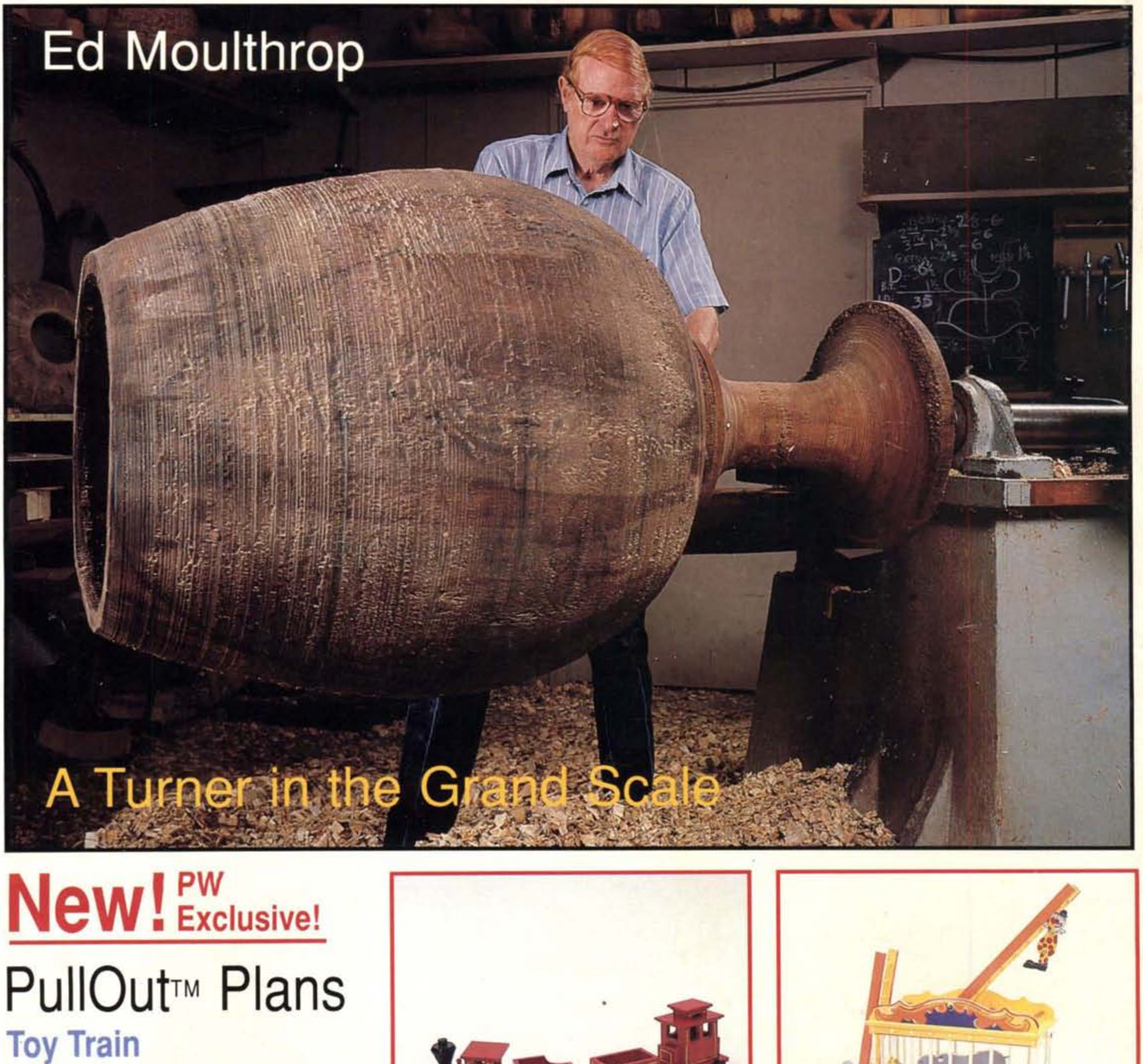
Popular Woodworking

Issue 46 December/January 1989 $3.75

Dining Table • Spaghetti Measure • Toy Train and Circus • Child's Cupboard



Ed Moulthrop

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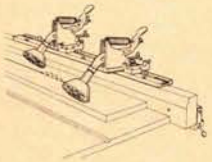

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Popular Woodworking

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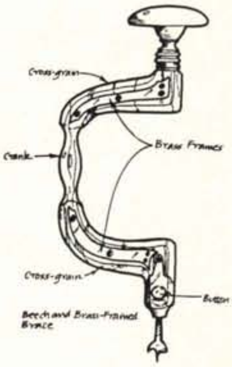
On the Cover

As you can see, Ed Moulthrop likes to turn large objects. His famous bowls are collected by museums, politicians and celebrities around the world. Here, he's working on a stemmed chalice that is 60" high × 33" diameter made of highly figured tulipwood. The stem was rough–turned separately from the bowl, but is attached for the finish turning. The stem is also hollow, with walls that are about 3/4" thick to facilitate PEG penetration and subsequent drying. On page 30, Hugh Foster discusses Moulthrop's process as a witness to "The Birth of a Bowl."

photo by Paul G. Beswick



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Clear Cuts

I recently learned from PBS that man is no longer considered to be the only creature that uses tools. For a long time, anthropologists had been saying that the ability to make and use tools was the one feature that set us apart from the rest of the animal kingdom. Other critters have thumbs; many have languages. You've seen Koko the gorilla using sign language to communicate with people in English.

Jane Goodall tells us that chimpanzees poke sticks down ant holes to make ant popsicles, and she suggests that this is a tool. The monkey's mind has conceived a device that could fulfill a specific function. I might point out to Jane that he also saved a bundle and showed prudent environmental concern by making it from local materials. Now I guess they'll have to say that it's our ability to pick ties that match our shirts that makes us superior.

Please understand; I don't mean to put down monkeys in any way. I've always appreciated how smart they are, and how similar they are to us. And I do believe that if you put enough of them in a room with enough typewriters and time, they'll eventually come up with *Gone with the Wind*.

But I think it would take them considerably longer to come up with some of the tools we work with.

A well thought out tool has a certain subtlety and grace. The chimpanzee doesn't appreciate the use of brass in a tool. He can't really understand the satisfaction of an edge meeting a surface and executing a clean, effortless cut.

There's just something about a well designed tool. Hand tools in particular, are the most enjoyable study. How does this part fit with that part? Where do you adjust this to do that? How does it work? The best tools usually do one thing and do it beautifully. A good tool feels right to use.

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All the chimpanzee has been able to manage is lunch.

David M. Camp

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Popular Woodworking (ISSN 0884-8823) is published bimonthly by EGW Publishing Co., 1300 Galaxy Way, Concord, CA 94520. Second-class postage paid at Concord, California and additional mailing offices. POSTMASTER send address changes to *Popular Woodworking*, 1300 Galaxy Way, Concord, California 94520.

SUBSCRIPTIONS:
A year's subscription is $17.00; two years' worth is $30.00; outside of U.S.A. add $5.00/ year. Send all subscriptions and correspondence to:

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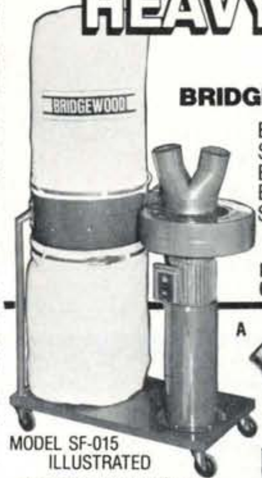

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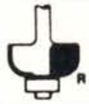		COVE				
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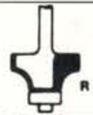		ROUND OVER				
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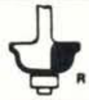		ROMAN OGEE				
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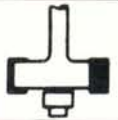	#11	3/8'' RABBETING	Deep 3/8''	1-1/4''	1/2''	$14.00
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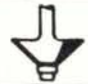
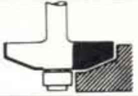
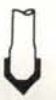
	#12	45° Chamfer	45° Angle	1-1/2''	5/8''	$15.00
	#15	Raised Panel	20° Angle	1-5/8''	1/2''	$25.00
	#35	1/4'' V Groove 90°		1/4''	1/4''	$ 8.00
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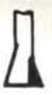	#16	3/8'' Dovetail 9°		3/8''	3/8''	$ 7.50
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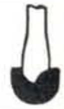		CORE BOX (ROUND NOSE)				
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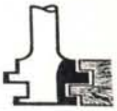
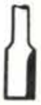
	#056	Tongue & Groove (FOR WOOD THICKNESS FROM 1/2'' to 1'') 		1-5/8''	1''	$30.00
	#24	1/4'' Straight Bit		1/4''	3/4''	$ 7.00
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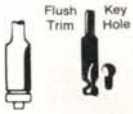 Flush Trim Key Hole	#13	1/2'' FLUSH TRIM		1/2''	1''	$ 8.50
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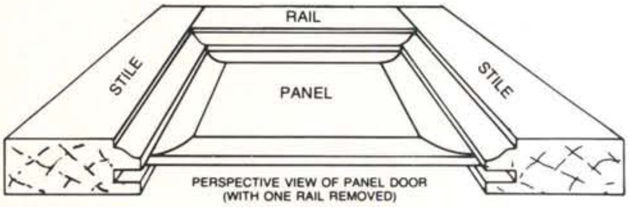

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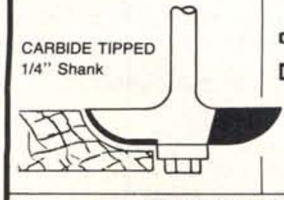

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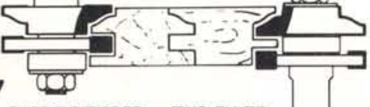

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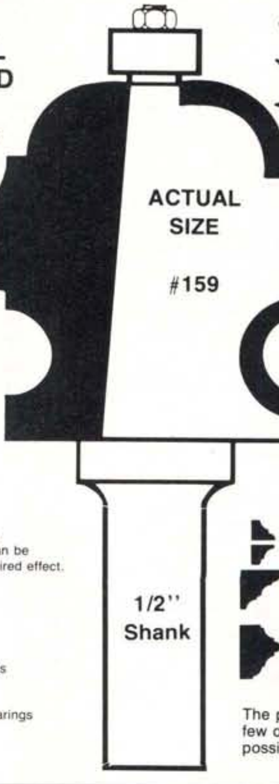

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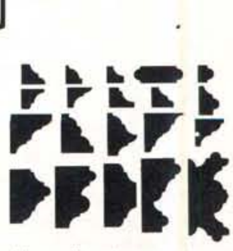
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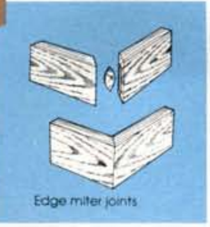
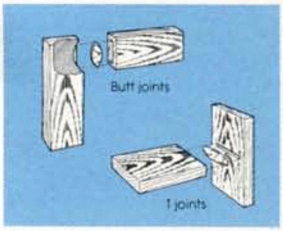
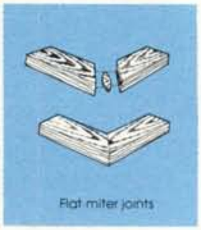
The Freud joinery machine is a plunge cutting tool. It has a rotating carbide cutter that creates an elliptical slot in the surfaces to be joined. The splines, or "biscuits" as they are called, are inserted into the slot along with any water based glue. Because the biscuits are made of wood, the water makes them swell in the joint making an extremely strong and firm bond.


Edge miter joints



T joints


Flat miter joints

1 Lay Out

The boards that are to be joined should be placed together and the location of each joint marked on both pieces. The vertical fence is adjusted to the depth desired for the slots. Turning the wing nuts on the side of the fence allows it to move easily in the tracks. The fence is accurately calibrated to allow you to easily move it to center of the joint *(See Figure 1).*

At this point, you have determined the horizontal location of the joint by marking the wood and vertical location of the joint by setting the fence.

2 Cut

You are now ready to make the slots for your biscuit joint.

There is a red indicator line on the front of the fence and a corresponding red mark on the base plate *(See Figure 1).* You can use either of these marks for alignment with the lines drawn on the mating pieces of wood.

With the wood securely held in place, align the red mark with the line on the board. With one hand you can grasp the body of the machine. The other hand is placed on the handle. Turn the machine on and, with a steady forward motion, push the joiner body forward to make the biscuit slot. Repeat the process for each marked area on all of the wood pieces.

Simple and Easy!!! The wood particles are automatically ejected through the machine's exhaust port.

3 Assemble

Apply a water based glue to the slots and surfaces being joined. Insert the biscuits in the slots and push the boards together. For best results you will need to clamp the joint together for the glue manufacturer's recommended drying time.

There you have it, 1-2-3!! An extremely strong joint produced quickly and easily by you and the Freud Joiner Machine.

You will find a complete instruction "How to" book with each machine. Illustrated with photographs and drawings, it is designed for those woodworkers not familiar with biscuit joinery. The Freud biscuit joiner will prove to be a highly valued tool for your woodworking projects.

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MITER JOINTS? NO PROBLEM!

By reversing the fence, you can join mitered pieces (See Figure 2). *The steps are the same.*

Mark the location of your joint and set the fence to the vertical height needed. Line up the fence with the mark and make your cut. Apply glue — insert biscuits — clamp!

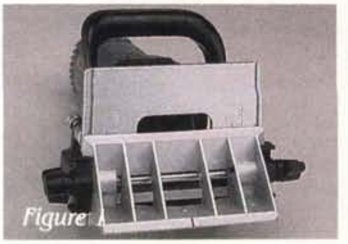
Figure 1

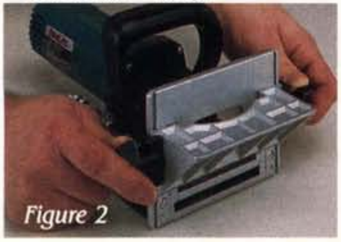
Figure 2

Booklet

HOW TO USE THE FREUD JOINER MACHINE

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MODEL G1029: Features 2 bags, 2 H.P. motor that draws 10 amps at 110V and 20 amps at 220V, 1182 ft.^{3} min., base measures 20″ x 35″, two 4″ intake holes. Weighs 210 lbs. ONLY $295⁰⁰ F.O.B. Bellingham, WA or Williamsport, PA

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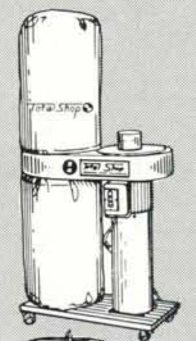

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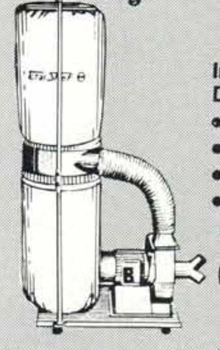

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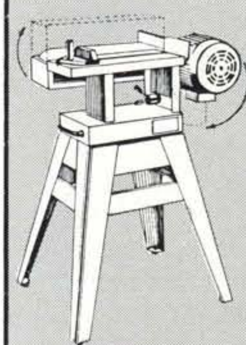

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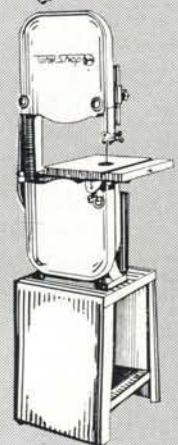

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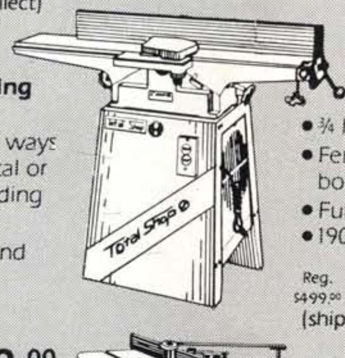

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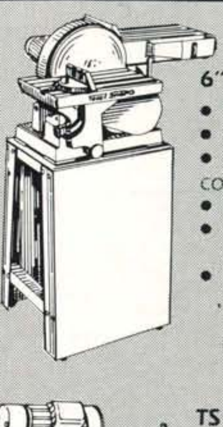

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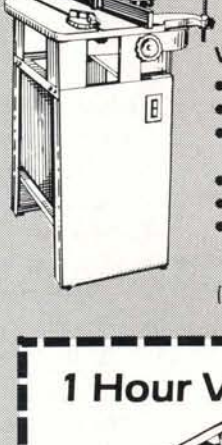

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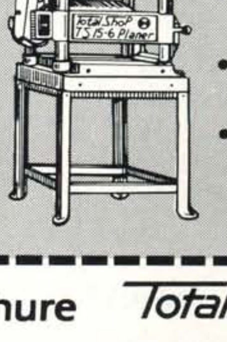

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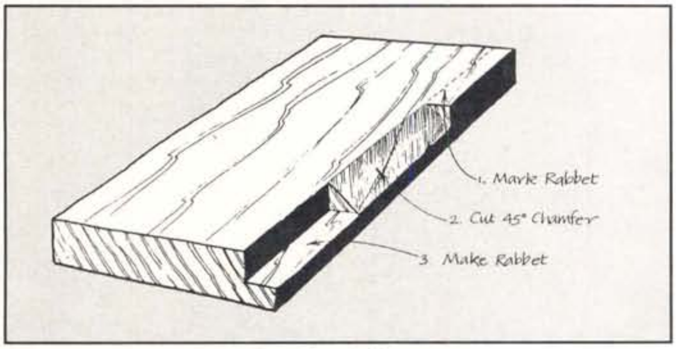
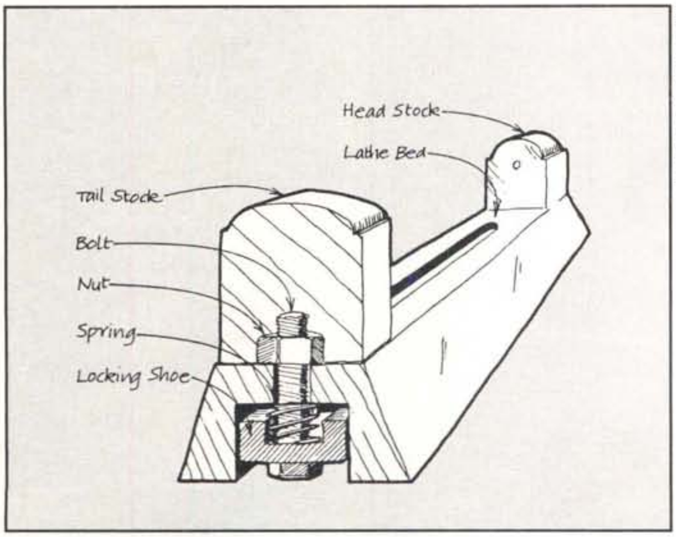


Routing Oak

While making a display cabinet of oak and glass, I needed to cut 1/2" rabbets in the oak. In spite of my sharp router bit, I found myself splintering the oak. To avoid this, I first knocked off the sharp corners of the oak down to a depth equal to the rabbet (1/2") with a 45° chamfer cutter. Then I went back over it to cut the rabbet, and got no tearout.

Kingsley Hammet
Santa Fe, NM

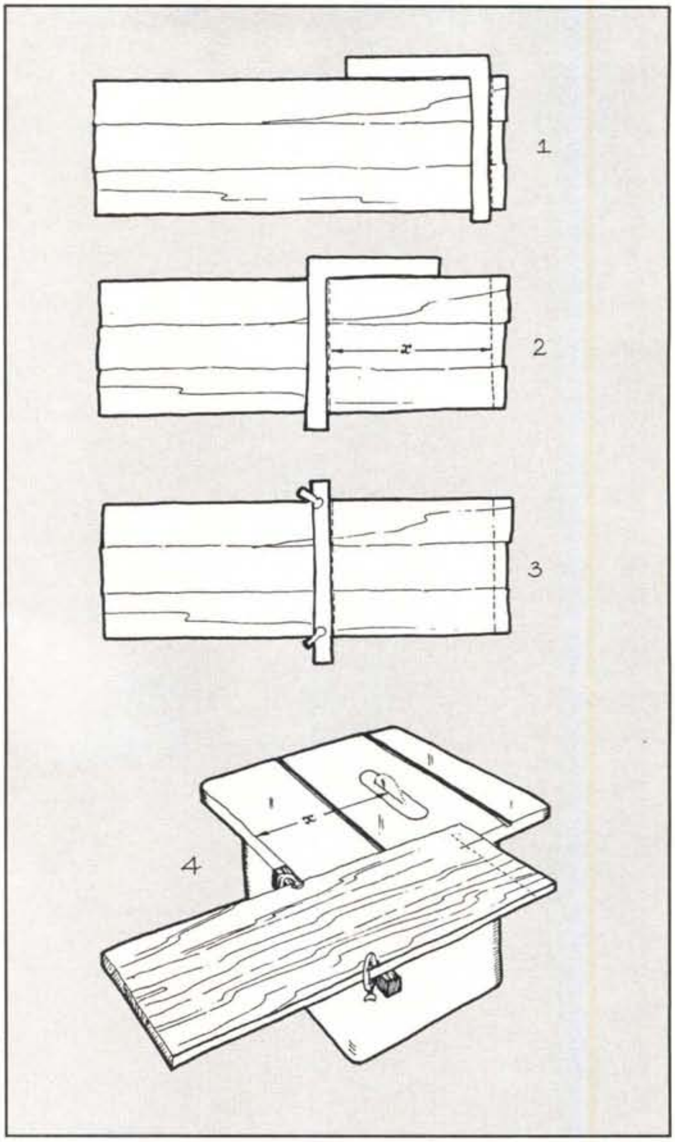
illustrations by Graham Blackburn



Tailstock Tip

How many times have you gone to move your lathe's tailstock and had it jam when the metal locking shoe catches? I found a spring to fit over the bolt and between the bed and locking shoe. When you loosen the tailstock the spring expands, holding the shoe away from the bed so the assembly can slide easily.

Jerry Ernce
Broken Arrow, OK



Squaring on a Table Saw

One of the biggest problems I have in my shop is squaring a large board that I've glued up from strips. Even with jointing, the two straight edges may not be exactly parallel, so you can't flip it over to reference the cut from both sides. I developed the following method to ensure a square board.

Use a framing square and mark one end of the board square to one side, and mark the edge you use as a guide. Measure the distance from the outside edge of the saw teeth and outside edge of the saw table (X). Place a square against the reference edge, and mark the distance (X) from the first line you marked.

Clamp a straightedge on the second line. (The clamps must be placed to the right of the straightedge.) Now flip the board over and let the straightedge butt against the right side of the saw tabletop. The straightedge and the tabletop will serve as a fence to guide the piece straight, and you will have excellent control. Do the same for the other end using the same reference edge.

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by Hugh Foster

Encyclopedia of Furniture Making by Ernest Joyce, revised and expanded by Alan Peters; Patrick Spielman, Technical Consultant (Sterling Publishing Company, 2 Park Ave., New York, NY 10016; ©1987) hardcover, $29.95

When I saw the price tag on *Encyclopedia of Furniture Making*, I thought, "What a rip–off." I recalled paying only about a third of that for the copy I bought on sale in 1981. I started comparing the volumes, ready to write a most negative review of the new edition: The older edition had a seven–page table of contents, compared to the single page in the new one, and the older edition paid homage to its sources with a bibliography. No such luck in the new one. The new one is only about 25 pages bigger, but I'd swear the print is bigger, so it may actually contain less information. In fact, if I hadn't read the new edition with some care, it would be possible to carry these quibbles to extremes.

But that would not be an honest review. Editor Alan Peters has essentially re–written the book. Since basic materials haven't really changed much (except in price) Peters has done little more than consolidate the information in the sections that deal with materials. But where things have changed since the original publication, Peters has brought the information and related photos right up to date. He includes Japanese tools and electronic tools (though one might wish for more thorough discussion of the biscuit joiner and the sanding frame for the variable speed belt sander). Stationary tools are also updated, illustrated with mainly British brands. CADCAM (computer–aided design/computer–aided manufacturing) is discussed along with robots and other automation techniques. In other words, Peters has prepared this book for the twenty–first century reader.

His chapter, "Workshop Layout and Furnishings," contains the most intelligent advice I've seen regarding lighting. Joinery (except biscuit joinery) is discussed thoroughly and concisely. Carcase construction and knock–down fittings get special emphasis, as do legs, frames, sliding parts, drop–leaves, and tambours. Hinges, locks, casters, glides, bookcase fittings, height adjusters, and other hardware items are discussed more thoroughly than they are anywhere else. Straight and curved work are both covered. A short section on draftsmanship and workshop geometry convinces me that there may be hope for me to one day be able to draw pictures of my work rather than rely on an "in–my–head" picture to guide my construction.

A most useful section treats "typical" furniture: What is it? Where does it go? What are its usual dimensions? and the like. This section features excellent photos and some drawings of exciting new work; the color photos in this section are a wonder to behold. There are even sections about church furniture, outdoor furniture, repair and restoration, finishing, and cost estimating.

An encyclopedia is meant to contain short entries on many subjects. As such, this book can be useful to *anyone* working in wood, allowing instant access to a wide range of topics in one volume.

Know Your Woods: A Complete Guide to Trees, Woods, And Veneers by Albert J. Constantine, Jr., revised by Harry J. Hobbs (Charles Scribner's Sons, 115 – 5th Ave., New York, NY 10003; ©1959, 1975, 1987), paperback, $9.95

Initially published in 1959, this book was revised in 1975. The down side of this is that the book is at least a dozen years old and much of it 28 years old; its appearance is rather old–fashioned, some would say dated. The up side is that the authors are among the all–time greatest experts on their subject, and their subject is one that doesn't really change much. The Constantine family has been a New York timber merchant since 1812; for many years Constantine and Company acted as the official measurers, weighers, and inspectors of all foreign timbers entering the port of New York. Thus, the author began at an early age to acquire his extensive knowledge and love of woods.

The first fifteen chapters (132 pages) are the "story" part of the book. Chapter 1, "A Tree Lives," is the kind of writing that brings biology to life. School science texts should be so artfully written. Chapter 2 deals with identification of woods, 3 with the scientific aspects of naming trees, 4 with how to know the trees by name. Chapter 5 treats getting the logs out of the forests of the world, and 6 deals with making veneer of the logs. Chapter 7 deals with the physical appearance of wood. Each of these is directly relevant to the thesis stated by the title, *Know Your Woods*....

The next couple of chapters seem at least somewhat irrelevant from this woodworker's perspective, for they deal with "Woods of the Bible," "Planting Trees around the World," "State Trees," "Drugs from Trees," "Little Known Behaviors of Trees and Woods," and "Collecting Woods as a Hobby." The chapter "Modern Craftsmen Use a Wide Variety of Woods" seems to display an amazing grasp of the obvious. Finally comes a chapter of questions about various woods:

Q. What wood is known as the "ebony of America?"

A. Persimmon

Q. What wood has a peculiar scent similar to that of old shoe leather?

A. Teak

Fortunately, we don't have to "pass" this 137–question "test" to move onto the real meat of the book, the profusely illustrated "Part Two: Woods from Abura to Zebrano." For the next nearly 200 pages, the authors treat every wood I've ever heard of—and lots more besides—in terms of:

1. preferred common name
2. scientific name
3. derivation
4. other common names
5. brief description of tree, size, peculiarities, etc.
6. range of species—native range and, in some instances, area of cultivation outside of native habitat
7. color of wood
8. physical properties of wood, such as physical gravity
9. seasoning behavior
10. strength properties
11. dimensional stability (shrinkage)
12. workability
13. utilization
14. other information

***Hugh Foster** is an English-teaching woodworker in Manitowoc, Wisconsin.*

Here is a sample of such an entry:

"**Ash, White** *Fraxinus americana* (americana—of America)

"This is a heavy wood with an average weight of 42 lbs. per cubic foot. The heartwood is brown to dark brown, sometimes with a reddish tint. White ash is often confused with hickory but the zone of large pores is much more distinguishable in ash than in hickory.

"This wood is strong and stiff, has good shock resistance and is noted for its excellent bending qualities. It is used almost exclusively for all types of sports and athletic equipment such as baseball bats and long oars. Almost universally it is also used for handles of shovels and spades, and the long handles of forks, hoes, and rakes. In the lumber form it is particularly valuable for the bent parts of chairs. Occasionally, high grade logs are cut into veneers which are very attractive in decorative work (p. 148)."

Three drawings and a half–page photo illustrate this entry.

Following this most useful section are a glossary of terms, a bibliography, and two indexes, one for just wood types, the other more general.

The only way I can think of to improve this book would surely raise its price beyond the realm of reason: In place of the well over 200 excellent black and white photos, I would substitute color photos of comparable quality or perhaps even supply representative specimens of wood veneer to aid in the identification of wood. Despite its excellence, *Know Your Woods...* failed to help me identify the two beautiful "mystery planks" that inhabit my shop, awaiting a project.

This pair of reissues make an important contribution to the literature of woodworking—if you didn't get them the first time around, they merit at least a look now. Your woodworking library will be incomplete without them.

World Woods in Color by William A. Lincoln (Macmillan Publishing Company, 866 Third Avenue, New York, NY 10022; ©1986) 320 pages, hardback, $39.95

William Lincoln spent forty–odd years in the timber and veneer trade in England, and his feeling for his subject is very good. His illustrations are much better than those in Albert J. Constantine, Jr.'*s Know Your Woods*, but are they $30 better? That's *your* call. My favorite book of this type (up until now) had always been the *Fine Hardwoods* Selectorama by

continued on page 19

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Videoscene

by Alan Marks

Tiling Countertops/ Tiling Walls/ Tiling Floors, with Michael Byrne, ©1987 by The Taunton Press, 63 South Main Street, Newtown, CT 06470, 60 minutes, 75 minutes, and 60 minutes, respectively, $29.95 each (or $14.95 each to rent)

These three tapes supplement an excellent book entitled *Setting Ceramic Tile* (©1987, The Taunton Press, $17.95) by the same author.

Often as not, someone enterprising enough to build his own kitchen cabinets will want to tile his new countertops as well. Having drawn this crucial connection between woodworking and tilesetting, let me explain that for my next column I plan to review a new series of five tapes on residential cabinetmaking.

During the course of my amateur career as a home–remodeler, I have often searched in vain for information on setting tile. Whatever scanty information I came across, I bought, since any data at all was hard to come by. None of it provided a complete, up–to–date overview of modern methods and approaches. I had started to imagine that tilesetters everywhere were conspiring to protect the integrity of their craft from do–it–yourselfers. But now, thanks to Michael Byrne and The Taunton Press, one can not only read about it, but also watch it done on the TV screen from the sanctuary of the sofa.

You actually do need the tapes to get the full story on tiling, especially in order to use the tools properly. There is some repetition from tape to tape; for example, sequences on mixing thinset and using snap–cutters and biters are shown in each of the three, but this is because each is intended to stand alone and provide complete instructions. It is not necessary to buy the entire series if you are only interested in one of the topics.

The tapes' producer had a small set built in the filming studio. It represents a small bathroom featuring a window over a small tub with fixtures, a pony wall, a toilet flange, and a vanity with a cutout for a sink. Additionally, a framed–in, cut–off shower stall floor was on hand so that building, waterproofing and tiling a shower pan could be demonstrated as well. All three videos were taped simultaneously on this set and a goodly quantity of the problems a tile mason faces were present and accounted for.

Michael Byrne's expertise and insistence on quality work appealed to my sense of integrity. I can't see how he could have done it any better. It was, however, painfully embarrassing to be made aware of all the things I did wrong when I tiled my own kitchen and shower years ago.

Before I cover the videos, though, let me briefly describe the contents of the companion book. Its organization seemed totally logical and straightforward to me, and it comes admirably cross–referenced and indexed. The first of two parts deals with basics, containing chapters on tile types and terminology, tools and their usage, setting materials (mastics, adhesives and grout, their various types, preparation and application), surface preparation, and layout techniques.

The second part walks the reader step by step through six actual projects done by the author. Tiling floors, countertops, and showers in both thinset and mortar beds (the two predominant methods) is covered in detail from start to finish. A final chapter deals sparsely with special projects such as butcher blocks, swimming pools, and steam rooms. At the end are appended sources of tools and materials. One omission I noted: the author neglected to say what weight tar paper, or roofing felt he used for waterproofing purposes. (In the videos he tells us he uses the fifteen–pound variety.)

Since this column is video–oriented, let's take a peek at them now.

In **Tiling Countertops** Byrne demonstrates the thinset method using backer board and a waterproofing membrane. The objective is to tile a countertop incorporating a sink. He also shows a finished sample of a mortar bed countertop and introduces the materials used for this method. He tells us there is no structural advantage to using a mortar bed, but using backer board limits one to more or less flat surfaces, whereas mortar can be used to produce a shaped substrate for more creative work.

Backer board is a relatively new, easy–to–use product on the tile scene, and it totally replaces mortar beds for many applications. A portland cement, fiberglass–reinforced material in sheet form, it is definitely something a do–it–yourselfer should know about. I have purchased it under the trade *name* "Wonder Board," not at all, to my thinking, a misnomer.

Choosing the type of layout and trim depends on the sink type, and as Byrne demonstrates, the sink itself, together with the countertop dimensions, determines the placement of cut tiles. He shows how to do a layout with a jury stick, cutting and installing backer board with thinset and then laying down a waterproofing membrane with the same material. He shows how to use the snap cutter and the wet saw. Everything he does he performs impeccably but I wonder why, when laying the field tile, he did not show how to clean up excess thinset with a margin trowel at the borders of the field. I remember doing this from time to time when it was necessary to take a break on a tiled deck I did once. He shows detailing and setting trim tile, the final step after installing cut tile, and finally, he demonstrates his grouting technique.

One other question haunts me after watching the three videos, all taped in this bathroom. Why did Michael Byrne neglect to trim one edge of the countertop backsplash with what I believe should have been quarter round trim? It was left unfinished, but should not have been. Also, he neglected to include faucets in the countertop demo, so he was unable to show how to cut tile to fit around them. In the same vein, there is usually at least one electrical outlet box to be tiled around in a backsplash, but that was missing too.

In **Tiling Walls**, which takes seventy–five minutes, Byrne covers a lot of ground. The walls chosen surround a shower–tub, incorporate a window and a pony wall, and use two distinct construction methods with two different materials for waterproofing. He lays walls with a mortar bed and tar paper (intriguing technique!) and does the pony wall with a 30–mil plastic membrane over backer board.

To accomplish the best possible layout he contrives a jury stick, builds out the pony wall in order to avoid cutting tiles, and improvises a coved transition for the same reason. I was espe-

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Alan Marks is a cabinetmaker in Carmel Valley, California, and a contributing editor to PW.

cially taken by Byrne's competent demonstration on how to float a mortar bed on a vertical surface with wire reinforcing. This is something I would never undertake without seeing it done first. Now I think I might give it a whirl.

There is invaluable information on dealing with a problematic tilted bathtub, plus how to work with out–of–plumb walls—easy enough to do when using a mortar bed substrate. Throughout this tape he shows the many ways a straightedge can be used. Also in this one, Byrne cuts around shower faucets with a biter, and uses a snap cutter as well. His installation of trim tile around the pony wall, the window, and the radius bullnose trim provided necessary insights, and I particularly enjoyed seeing him float mortar for the cove and do the detail cutting for it. As in the previous tape, he gives a thorough demonstration of grouting.

Tiling Floors covers a lot of territory as well. The floor is done on a floated mortar bed with a tar paper waterproofing membrane. He constructs a floated mortar shower pan with a 40–mil plastic membrane, and cuts around a toilet flange as well as setting border and cove tiles.

Of the three, this tape caused me the most embarrassment, particularly concerning the subject of shower pans. The one I built before seeing this video will no doubt have to be replaced someday soon, together with a rotted out floor, alas! My only excuse is ignorance.

Sources for all of the materials used in the demonstrations may be found in an appendix to the above–mentioned book, another good reason why the book, at $17.95, should be considered an essential investment for anyone wanting to use the videos for instruction.

I found this set of tapes plus book to be the finest instruction available on tilesetting to date. I can heartily recommend it without any reservations. PW

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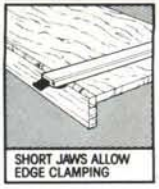
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The Business End

by William L. Smith

Questions About Estimated Taxes

I understand that as a self–employed woodworker I must pay estimated income taxes. How do I determine how much to pay and when to pay it?

The normal payment dates for estimated federal income and social security taxes for self–employed persons are April 15, June 15, September 15 and January 15. If you begin self–employment during the year, the following schedule would apply:

* If you start after March 31 and before June 1, your first payment date is June 15.

* If you start after May 31 and before September 1, your first payment date is September 15.

* If you start after August 31, the payment date is January 15th of the following year (although if you make the payment before December 31, it may help with your state tax bill for that year).

What conditions, then, would require that estimated federal taxes be paid?

IRS Form 1040–ES provides a worksheet and the forms needed to calculate and pay any required taxes. (Please note that I am addressing only federal taxes here. Requirements applying for state income taxes vary in each of the states.) Generally, you must pay estimated tax if you expect to owe at least $500 after subtracting any withholding and credits. Estimated taxes are not required if you expect your withholding and credits to exceed:

*90% of the tax due for the current year, or

*100% of the tax shown on your immediate past full–year return.

For example, let's say you calculate (with your spouse) a 1988 income tax to be $1,200. Your 1987 tax total was $1,234. $1,080 is 90% of $1,200, so if your withholding and credits total between $1,080 and $1,234, no estimated tax is required because 90% will have been paid. Just be sure it is 90% and not 89%, or a penalty may apply! When the difference between your withholding/credits and the 90% exceeds $500, estimated payments must be made per the schedule above. (Note that if two payment dates remain, pay half each time, and so forth.)

Continuing with this example, if your withholding and credits total $1,234 (the previous year's tax total) or more, no estimated taxes need be paid. Even if it turns out you owe $10,000, the balance can be paid with your return on or before April 15, 1989.

To determine the projected income, be sure to include all sources of income and itemized deductions for yourself and (if married) your spouse. As a self–employed woodworker, of course, you are responsible to pay self–employment tax on your net business income. For 1988, self–employment tax is 13.02%. This tax is due even if no income tax is due. As an example, assume you begin your business late in the year and have $3,550 gross receipts and business deductions of $2,100. Your self–employment net income is $1,450. At 13.02% your self–employment tax is $188.79. (Note: Please be sure that you are using the correct tax rates in estimating your income tax. Since the Tax Reform Act of 1986, tax rates and limits have changed significantly each year. In addition, Congress continues to make "minor adjustments" so double check to assure you are using the latest information available.)

It may seem impossible to be able to project so precisely what your total year income and expenses will be several months ahead. For this reason, I find most people are best off to use the "100% of prior year's tax" as the best course to follow. Generally, it will not be a great hardship and will assure that no penalties will accrue. If it *is* a great hardship, then it is worth the

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effort required to project your income accurately.

As with any tax matter, do consult your personal tax advisor before making final decisions in your unique situation.

If I find that I must pay estimated taxes, how do I discipline myself to have the money available when those large payments come due?

Each person must review their individual circumstances, of course, but let me make two suggestions that may help you move in the right direction.

First, by whatever method you choose, building a cash reserve is essential to your business success whether taxes are due or not. Therefore, the very best discipline is to put a certain percentage—probably about 30%—into a savings account that is separate from normal operating funds. This should be done with every collection you make, whether $50 or $5,000. Put the 30% (or whatever) aside. It will hurt at first, like withholding from a paycheck, but it can get very routine if you will just start doing it.

The 30% figure is not just pulled out of the air. 13% is for social security, 15% is for "normal" federal income tax, and then you may need as much as 8% for state and local taxes, depending upon where you live. 30% will at least get you close.

If your gross receipts include materials costs or substantial overhead, you will make appropriate adjustments, of course. But don't use this as an excuse not to start saving some of the money from your receipts for taxes. Start with 4 or 5 percent, if you must. Just start. If you don't start now, think about the fact that a year from now you will owe this year's tax, plus you will also owe for next year—probably more than twice what you owe right now.

Second, if you do have a business plan or projection of some sort, *use it*. Taxes should be an integral part of any plan. If taxes are not currently included, add the tax calculation and use that figure as a start to have the tax money on hand just as you have the money to make equipment payments, materials purchases, etc. Taxes are just another business expense, and you should always think of them that way. You want to minimize all business expenses—including taxes. Procrastination is as much a problem with self–employed businesses as cash flow and poor management. Start on the right foot from day one, and success will follow. **PW**

Book Reviews

continued from page 15

the American Hardwood Association, but that work, when compared to this new one, is just a pamphlet. This book gives roughly a half page of text with a large color photo to each of about 270 species, then shows closeup photos of selected grains of two dozen more. The book seems deceptively unimpressive—until you start comparing it to the others of its type. Is it worth the extra $30? Sorry, billfold; I'm afraid so. **PW**

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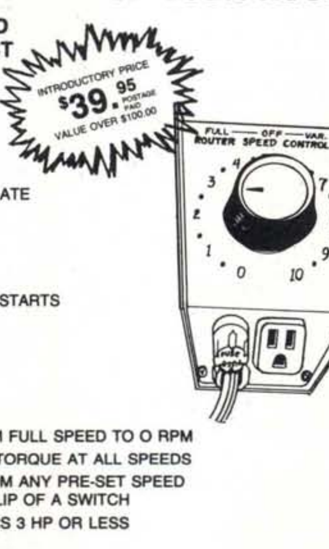

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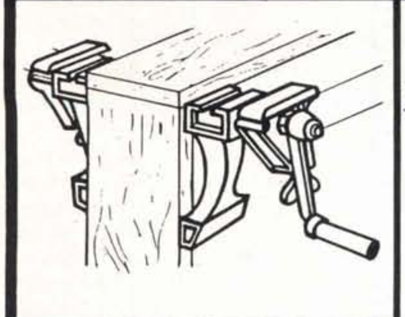

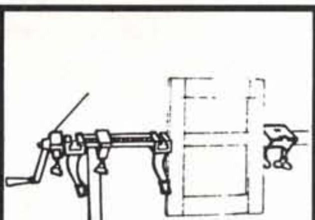

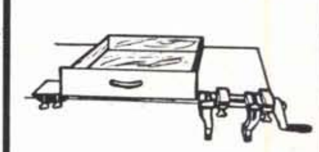

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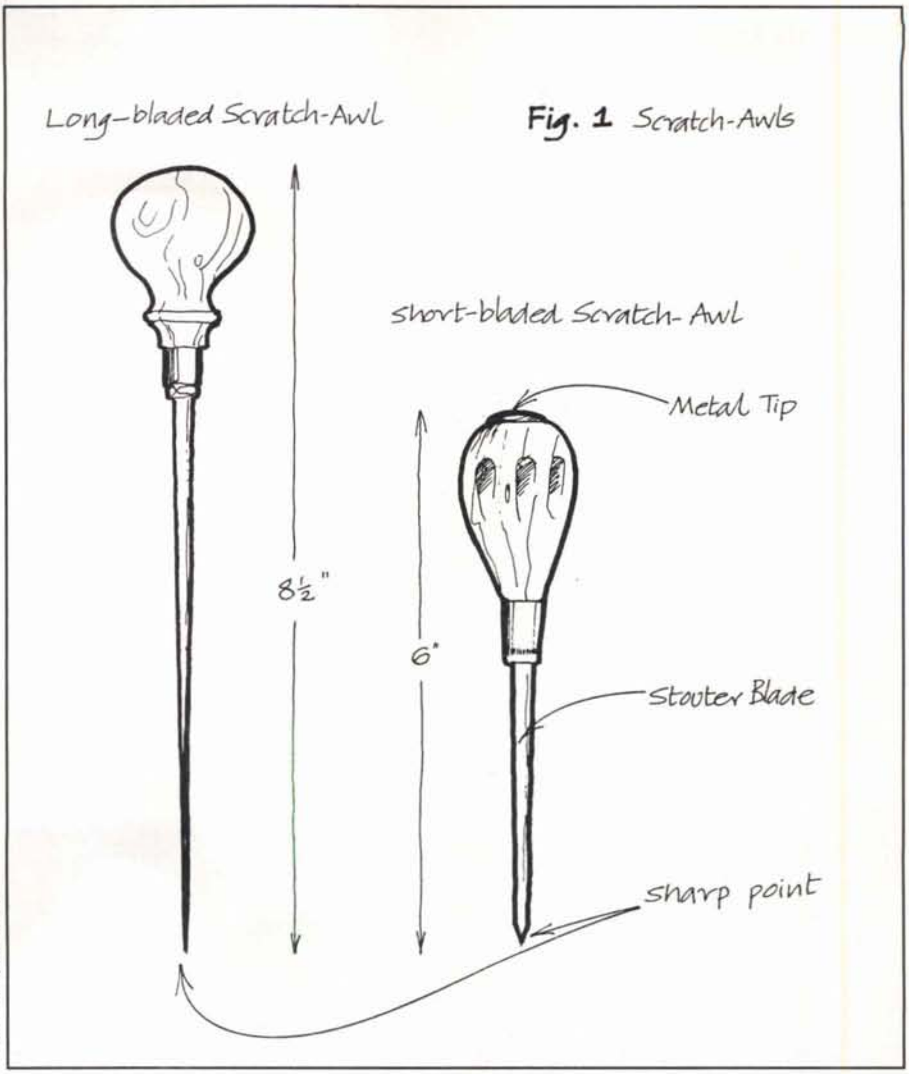
Tried and True

by Graham Blackburn

Boring Tools: From Bradawls to Beam-Borers

When we think of boring holes, the electric drill comes to mind. This tool has seen some interesting improvements in recent years, most notably the introduction of cordless varieties. Although infrequent or irregular users may find the recharging requirements inconvenient, it cannot be denied that liberation from the tool's umbilical cord is a great advantage. Contemporary technology has thus brought the form of the drill full circle. Once again it is possible to bore or drill from high up on a ladder or in tightly cramped crawl-spaces without the constraining tangle of power cords. While it is true that the electric drill offers the benefits of increased power, it should not be forgotten that before its introduction, holes were made wherever and however needed with a variety of handtools specially adapted for various tasks. Many of these tools can still be found; familiarity with them can prove very advantageous when a power drill—cordless or otherwise—is unavailable.



illustrations by the author

First, a few definitions, which are more conventional than strictly logical. Both boring and drilling mean the same thing: to pierce or make a hole in something. However, when metalworkers refer to a drill, it is the actual drill bit that is usually meant. When woodworkers say "drill," they usually mean the tool that holds the drill bit; the bit is normally more exactly specified as an auger bit or a drill bit, etc., as the case may be. Thus, in this article, when the word "drill" is used it will either be modified by a prefix to indicate a specific boring tool, modified by a suffix to indicate a specific form of bit, or used on its own to refer to the entire tool.

Awls and Gimlets

Starting with the smallest members of the boring tool family, we immediately run into an area of common confusion concerning the difference between awls and gimlets. Both make small holes—for starting screws, nails, or even simply to enable other materials to be passed into or through the material being pierced. The way in which they do this, though, is different. "Awl" is one of those words that has lost its original initial "n" by transference, and was originally speled "nal". An awl comes to a point—either simple or chisel-shaped. A gimlet, on the other hand, has a screw at its tip, just like a miniature auger bit. "Gimlet" (sometimes spelled "gimblet") is actually the diminutive form of the now obsolete word "wimble"—which meant practically the same as an auger; so think of a gim*let* as an "augerlette" and you will not confuse gimlet with awl.

Almost every trade possessed its own variety of awls. However, as far as woodworkers are concerned, there are but two kinds of awls: bradawls (usually now spelled as one word) and scratch awls.

Of these two, only the bradawl is a true boring or hole-making tool, since the scratch awl, as the name implies, is a marking tool, used to scratch a mark in the wood. If its point is kept sharp it can be very useful for defining a very precise point or line, but if abused and allowed to become blunt, it makes a mess, tearing the fibers of the wood across which it is dragged. For this reason a marking knife is commonly preferred. The scratch awl does have the advantage (when sharp) of being less likely than a knife to follow the grain instead of the desired line. For fine delineation a long-bladed scratch awl is an elegant tool (see Figure 1). The commonly available shorter and stouter design is well suited for marking points, occasionally being struck with a hammer to make a deeper indentation in the manner of a metalworker's center punch.

The bradawl is usually fitted with a steel blade from 1" to 3" long which finishes in a small chisel-shaped point

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***Graham Blackburn** is a furniture designer/maker in Soquel, California and the author of many books on woodworking and home maintenance including Floors, Walls and Ceilings.*

Fig. 2 Bradawl

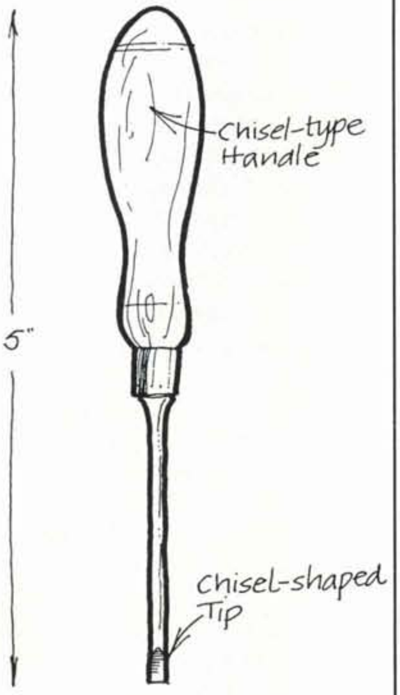


Fig. 4 Bow Drill

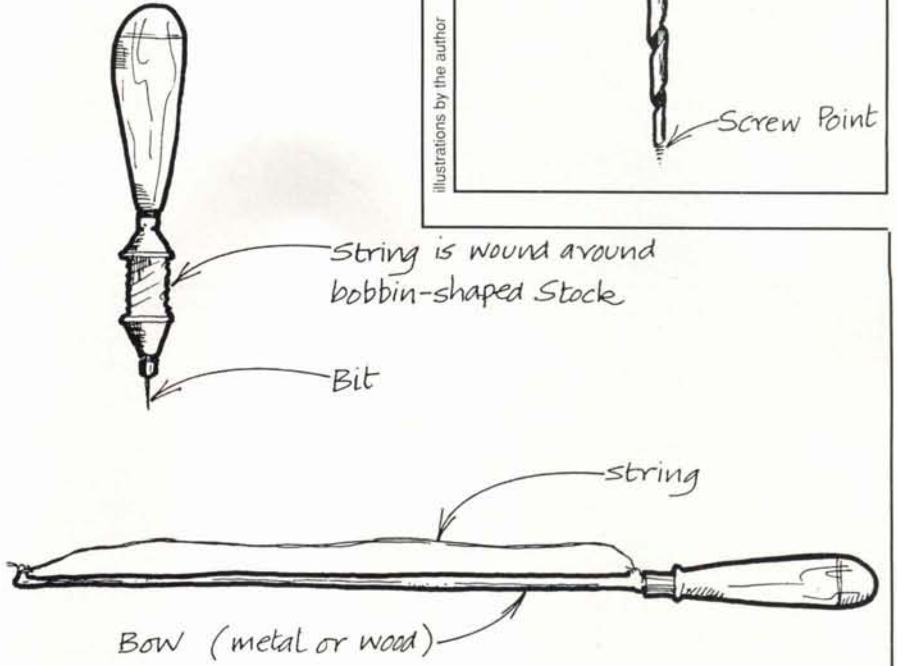
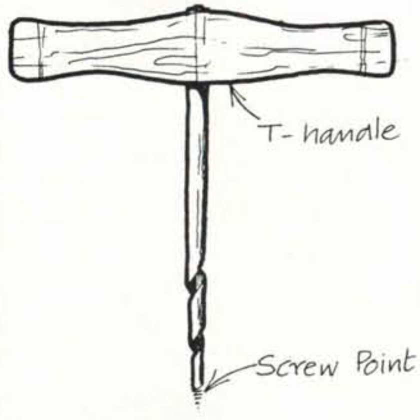


Fig. 3 Common Twist Gimlet



illustrations by the author

(see Figure 2). The handle is invariably straight and turned like a small chisel's handle (in distinction to a gimlet's handle, which is set at right angles to the blade). Its use, which is not always properly understood, is as follows: the chisel–shaped point is pressed into the wood at *right angles* to the grain, and the tool is twisted back and forth so that it works its way into the wood by pushing the fibers apart. If started with the point parallel to the grain, one has less control over the actual point of entry and furthermore runs the risk of splitting the wood to a larger extent than the hole is to occupy. This tool must therefore, like the scratch awl, be kept sharp, and not be allowed to bang about in the toolbox so that its chisel point gets blunted.

The gimlet also exists in a surprising variety of types. It is invariably furnished with a handle that forms a "T" with its metal shank. Its other salient characteristic is that whatever the design of the shank, it always starts with a screw point (see Figure 3). While this initially pulls the tool into the wood and pushes the fibers apart just like the bradawl, the gimlet is designed so that once it is entered into the material, it will then cut shavings and enlarge the hole.

Hand Drills

Drills, in one form or another (not including augers and braces), have been known for a very long time, as evidenced by representations of clearly recognizable tools on ancient Egyptian buildings and artifacts starting from around 2,500 B.C.! The variety common among ancient civilizations which has remained essentially unchanged to this day (being still commonly used in many third world countries) is the bow drill.

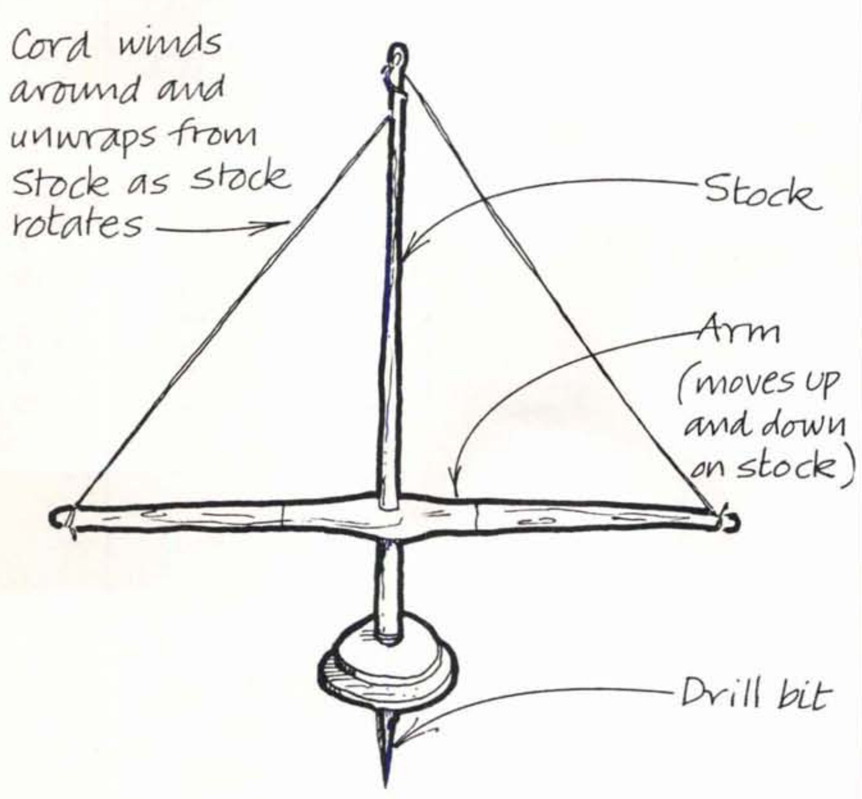
Basically, the bow drill consists of a straight or bobbin–shaped stock holding a drill bit which is turned by means of a string or cord wound around it (see Figure 4). It is supposed that the earliest version must have been developed from the string of a bow being wrapped around an arrow. A more recent design known as a fiddle drill consists of a straight, rather than curved rod (like a violin bow), with a slack cord attached to it. Although primarily used for relatively small holes, larger bow or fiddle drills were used with pads, or breastplates—like a modern breast drill.

The original pump drill, like the bow drill, worked by means of a cord wrapped around the stock (see Figure 5); however, unlike the bow, which was worked by being moved from side to side, the arm to which the pump drill's cord was attached was pushed up and down. Since the stock and its bit are required to rotate in both directions, its use is confined to relatively hard materials such as very dense wood, china, or stone. If used in soft wood, the bit would stick and be unable to rotate backwards.

The up and down motion of the pump drill's bow led directly to the invention of the Archimedean drill. Despite the ancient Greek name, the tool does not appear to have been known before the nineteenth century, having been so named probably as a result of increasing awareness of the Archimedes screw water pump used in the Levant (which raises water by means of a rotating screw). The Archimedean drill consists of a spiral shank rotated by a (usually) wood–covered nut that is moved up and down the shank (see Figure 6). Since the drill turns in both directions, the bits used are made so as to cut in both directions. The chief advantage of this drill is that being small and slender, it is admirably suited for use in narrow spaces where the use of an auger, a brace, or even an electric drill would be difficult or impossible.

An improvement on this basic type was an Archimedean drill fitted with a ratchet in the handle, enabling the drill bit to revolve in only one direction. From this type with its obvious advantages over the bow drill, it was but a small step to the double–spiral Archimedean drill (see Figure 7). The double spiral, together with a reversing device in the handle, allows a constant forward motion to be maintained regardless of the direction in which the handle is being moved. These tools, once quite common (Stanley® Tools marketed a "reciprocating" double spiral Archimedean drill for a considerable time) are now rare, but the principle behind them is embodied in the contemporary spiral ratchet type of drill and screwdriver. In fact, the modern push drill, most commonly exemplified by the Stanley® push drill (see Figure 8), is a direct descendant, possessing the added advantage of being able to be used with only one hand. Unfortunately, only its bigger cousins are capable of revolving only one way at a time; the push drill therefore still requires bits formed to cut

Fig. 5 Pump Drill


Cord winds around and unwraps from Stock as stock rotates
Stock
Arm (moves up and down on stock)
Drill bit

Illustrations by the author

Fig. 6 Archimedean Drill

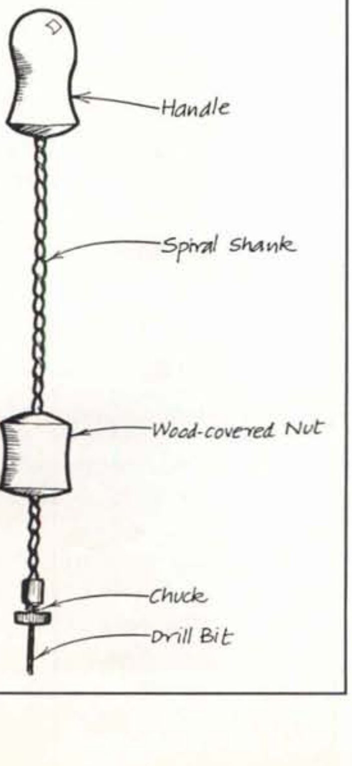
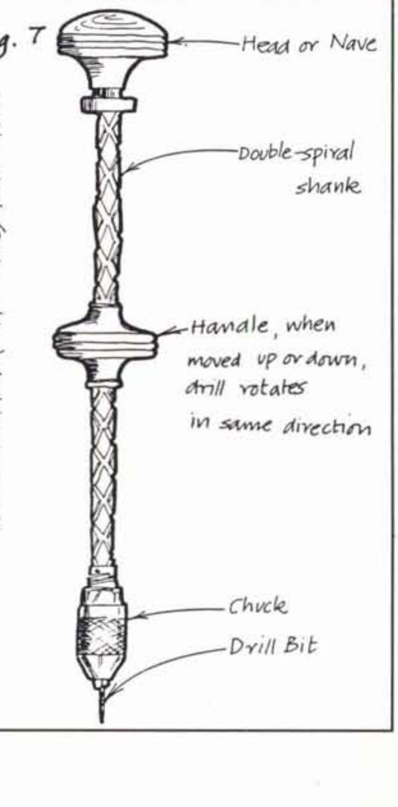


Fig. 7

Double-spiral (Reciprocating) Archimedean Drill


Head or Nave
Double-spiral shank
Handle, when moved up or down, drill rotates in same direction
Chuck
Drill Bit

in both directions. This makes the drilling faster but can sometimes cause problems in extracting the bit. For this reason, the push drill is really only useful for relatively small holes.

Of all the various hand drills, the one that is usually meant when the term is used today (and indeed the one that requires no other qualifying adjective) is the kind thought to have been invented towards the end of the eighteenth century in France and brought to its present level of perfection as a result of American innovations developed immediately after the Civil War (see Figure 9). The hand drill, made possible by the use of bevel gears in various combinations and the use of improved chuck designs, is an ideal tool. It is lightweight, compact, capable of positive movement in either forward or reverse direction, and very efficient as a result of the different gearing ratios made available by altering the relative sizes of the bevel gears. Older models are frequently far superior to those available today. Though some modern versions have "extras" such as hollow handles containing a selection of drill bits, and side handles that are attachable on either side, castings on the older tools are frequently stronger (and prettier) and the drills have extra gears to provide a surer movement, as well as adjustable cranks which can offer different speeds.

Breast drills are larger hand drills of the sort just described, but additionally fitted with some form of pad enabling the tool to be held firmly (and comfortably) against the chest, thus leaving both hands free—one for turning the crank and the other for holding the side handle. Older models dating from the middle of the nineteenth century usually had simple tapered socket or screw tightened chucks, and large saucer–shaped breast pads (see Figure 10). While simple in design, they are enormously effective and should not be passed over lightly. Of course, more recent models may be expected to possess more modern chucks, but contemporary new tools are rarely equipped with the same built–in levels (ensuring accurate horizontal boring) and niceties of gearing choices frequently found in earlier varieties.

Fig. 8 Push Drill

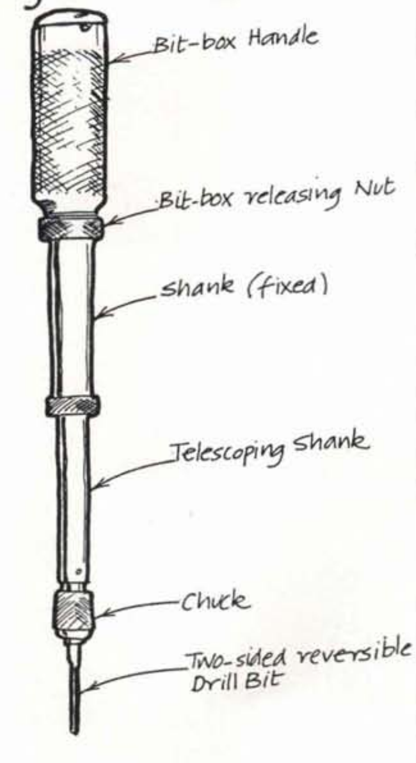
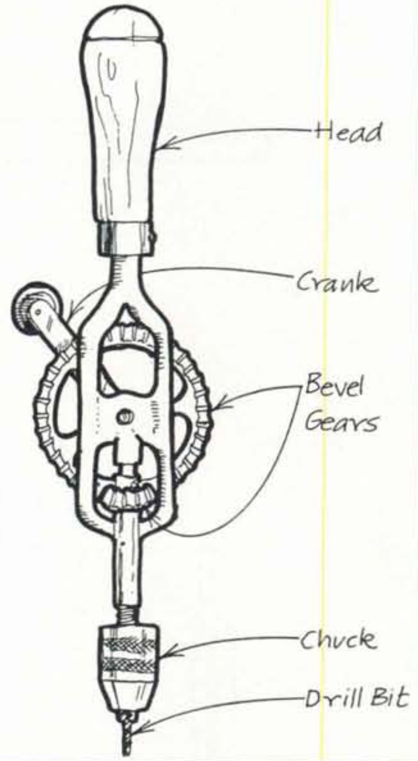


Fig. 9 Hand Drill



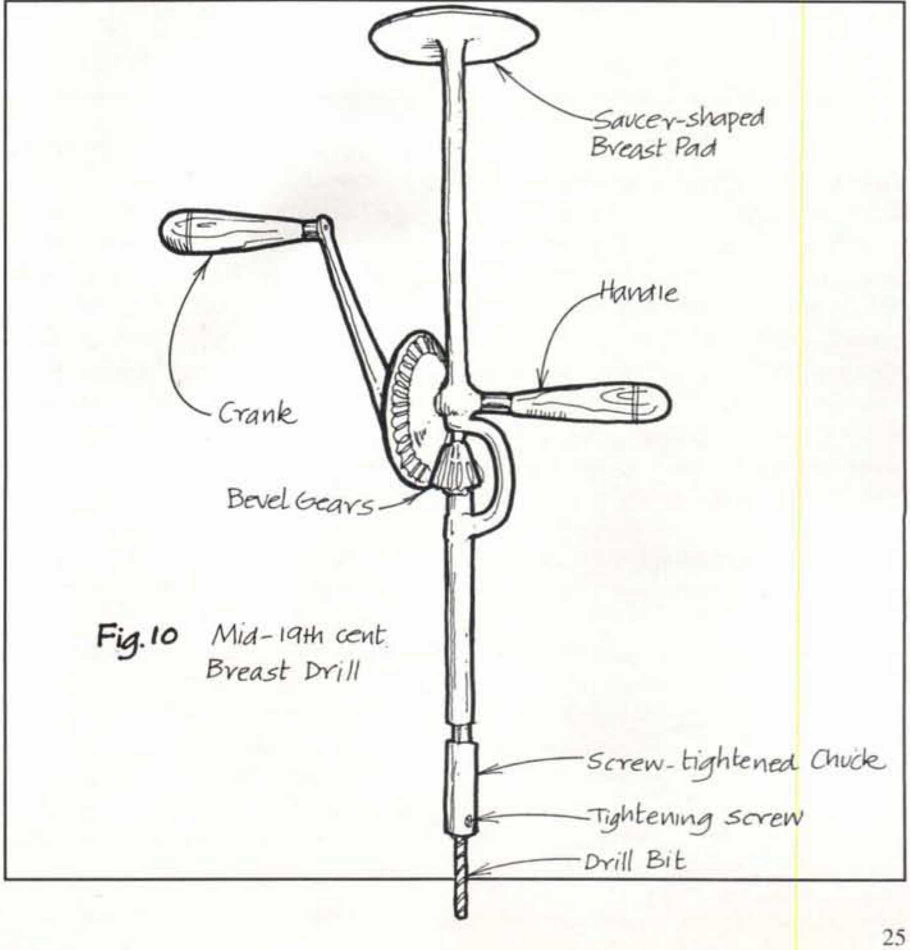


Fig. 10 Mid-19th cent Breast Drill

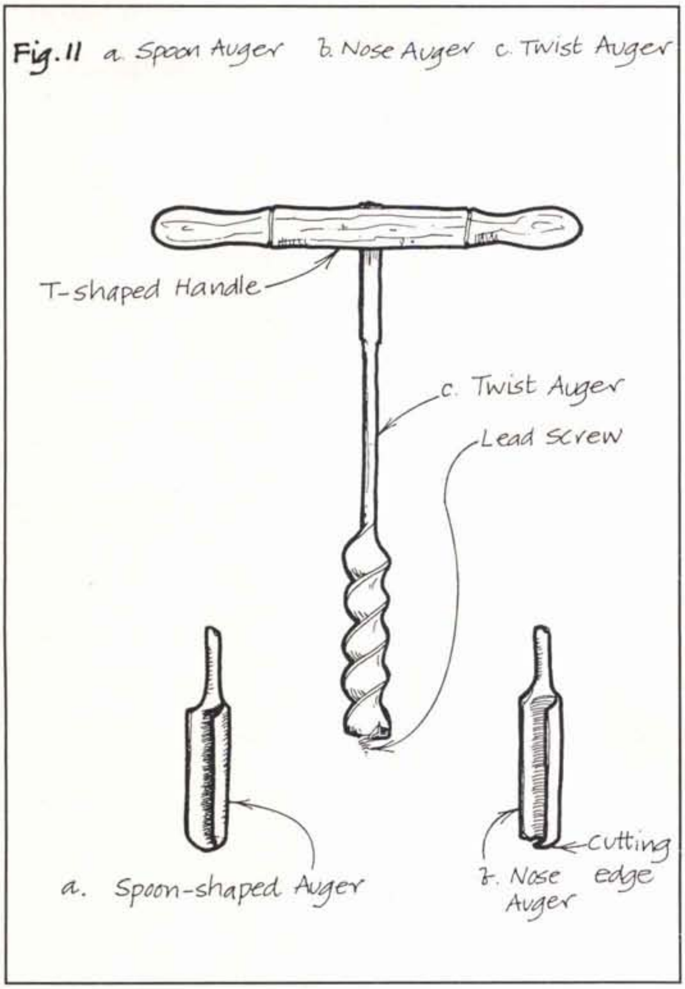


Fig. 11 a. Spoon Auger b. Nose Auger c. Twist Auger

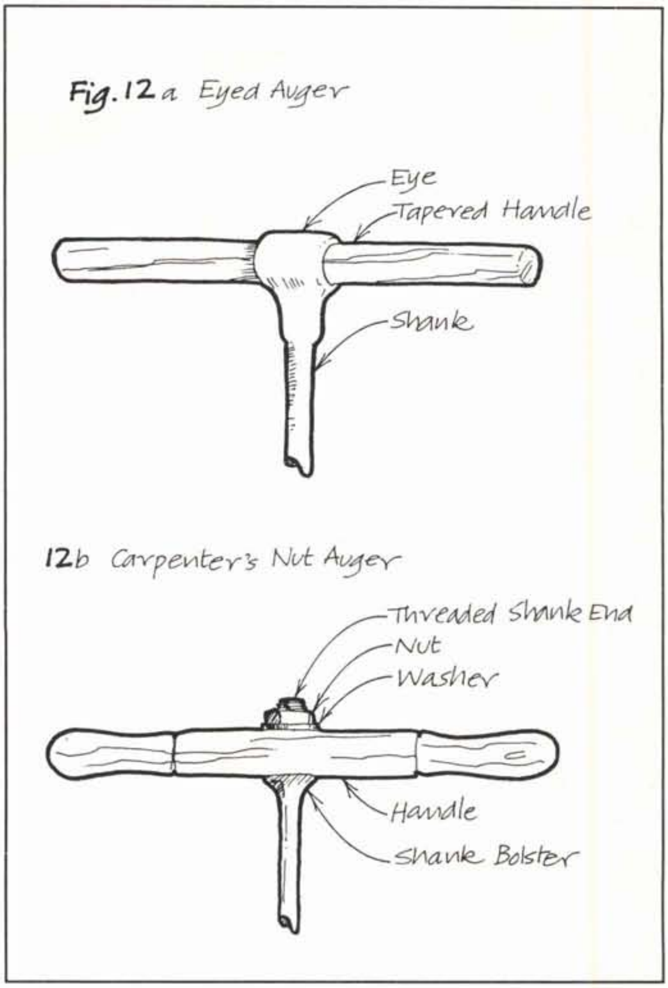


Fig. 12 a Eyed Auger

12b Carpenter's Nut Auger

illustrations by the author

Augers

This most venerable group of boring tools provided, until very recently, the only available method of boring large holes. Like "awl," the word "auger" has lost its initial "n" (as well as a couple of other letters). The original spelling—"nafu–gar"—gives a better clue to its original purpose. "Gar" is the Scandinavian word for "borer." "Nafu" is the word for navel, meaning the center of something, and the nave of a wheel is the center of the wheel's hub. Hence the auger was developed as a tool used to bore the large holes required in the center of wheels.

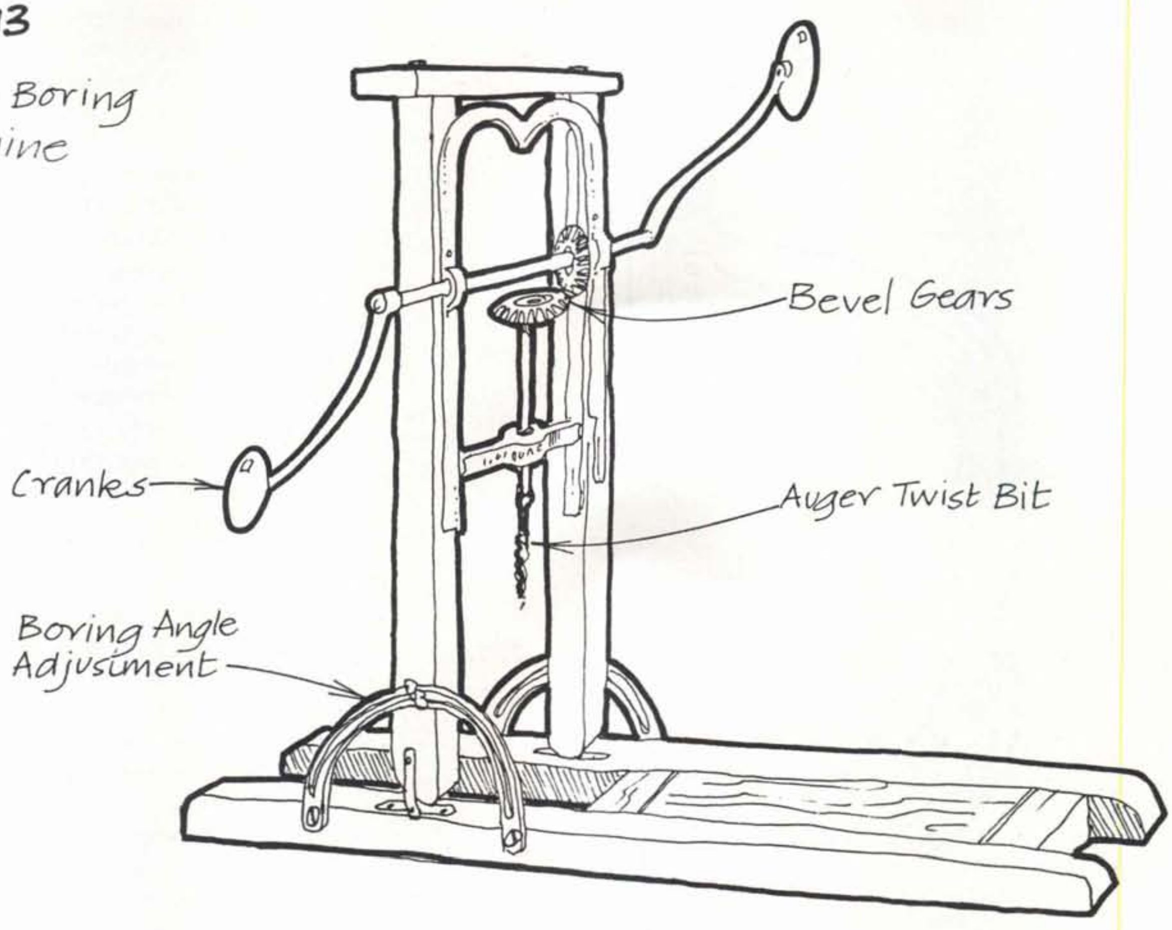
Its distinctive wooden handle, fitted to the metal shank so as to form a "T," is more vulnerable to wear and decay than the shank itself, so it is no wonder that only the metal parts survive from numerous Roman examples. However, many prints illustrate the use of this easily recognizable tool throughout the Middle Ages, up until which time the metal part was invariably spoon–shaped (see Figure 11a). Thereafter, the nose auger made its appearance. This has the shape of a half cylinder with the very tip bent to form a cutting edge (see Figure 11b) which cleans out the hole being made and at the same time helps to keep the auger firmly in contact with the wood to be cut—a difficult process if only undertaken by the pressure of one's hands which must be removed every time a complete revolution is made. Finally, towards the end of the eighteenth century, the now familiar twist auger (see Figure 11c) became popular.

One so–called auger still readily available—the hollow auger—is, in fact, no auger at all, but rather a form of bit, since it does not make any sort of hole but merely shapes a round tenon that may be fitted into a hole. To call it a hollow bit is hardly more exact, but it has no other name!

One other point of interest that should be cleared up while discussing the varieties of augers is the definition of "nut auger" or, as it is sometimes also referred to, "carpenter's nut auger." This is not a variety of auger made for a specific purpose, but rather a description of a method for attaching auger handles. Inasmuch as carpenters (and house framers) frequently found it necessary to provide themselves with augers of various sizes (but all for the same general purpose—boring peg holes in the timbers and beams of heavy timber–framed buildings), augers were sometimes made so that the handles were detachable, thus allowing one handle to serve several tools. The earliest method of accomplishing this was to forge the handle end of the shank into a ring into which a removable handle might be fitted as needed. These augers are known as eyed–augers (see Figure 12a). A later development that provided a more secure attachment was the cutting of a

Fig. 13

Wood Boring Machine



thread on the handle end of the shank. A hole was made in the center of the handle, which could then be placed over the threaded shank (also provided with some form of flange to prevent the handle from sliding too far down), and the handle could then be secured by means of a washer and nut (see Figure 12b)—hence the name!

The latest development of the auger is not strictly an auger, but since it employs the same form of auger twist bit and is used for the same purpose as many augers, this is as convenient a place as any to mention it. The boring machine (see Figure 13) largely replaced the carpenter's auger for the purpose of boring large beams (when peg holes were required in mortise and tenon joints). The auger twist bit is held in a metal frame which may in some models be positioned to bore holes at different angles. With the operator sitting astride the wooden platform to which this frame is attached, the bit is turned and fed into the wood by gears operated by two handheld cranks. Depending on the pitch of the lead screw on the tip of the bit and also sometimes by the gearing on the feed mechanism, the rate of boring can be adapted to the density of the wood. Aside from a 1/2" electric drill (which, it should be noted, lacks the secure angle alignment of the boring machine), there is no more efficient way of boring large holes in big beams.

The Brace and Bit

Whole books have been written tracing the development of the brace and bit, which is all the more surprising when one considers that it is among the most recently arrived of boring tools, not being known before the fifteenth century! Another surprising fact is that although metal versions were available by the sixteenth century, there was a long period when wooden forms predominated. These tools were subject to breakage at the narrow cross–grained parts which constitute the arms of the crank—the very feature that makes them so superior to the auger. (It is the crank which enables the brace to be used in a continuously circular motion, thereby avoiding the stop–and go–action of the auger which occurs as the position of the hands is changed with every revolution.) To strengthen these weak areas, metal facings, or frames, were added—hence the term "framed" or "plated" brace (see Figure 14). The development of these frames, together with the advances that were made in chuck design, has created an extreme interest in these tools. From the earliest all–beech models of the eighteenth century to the magnificent brass–plated, ivory–ringed, ebony and rosewood examples known as "Ultimatums" or "Ne Plus Ultras" of the late nineteenth century, no more handsome boring tool was ever made, and it is probably fair to say that, along with the wooden plough *plane*, no tool has been as much studied or as covetously collected.

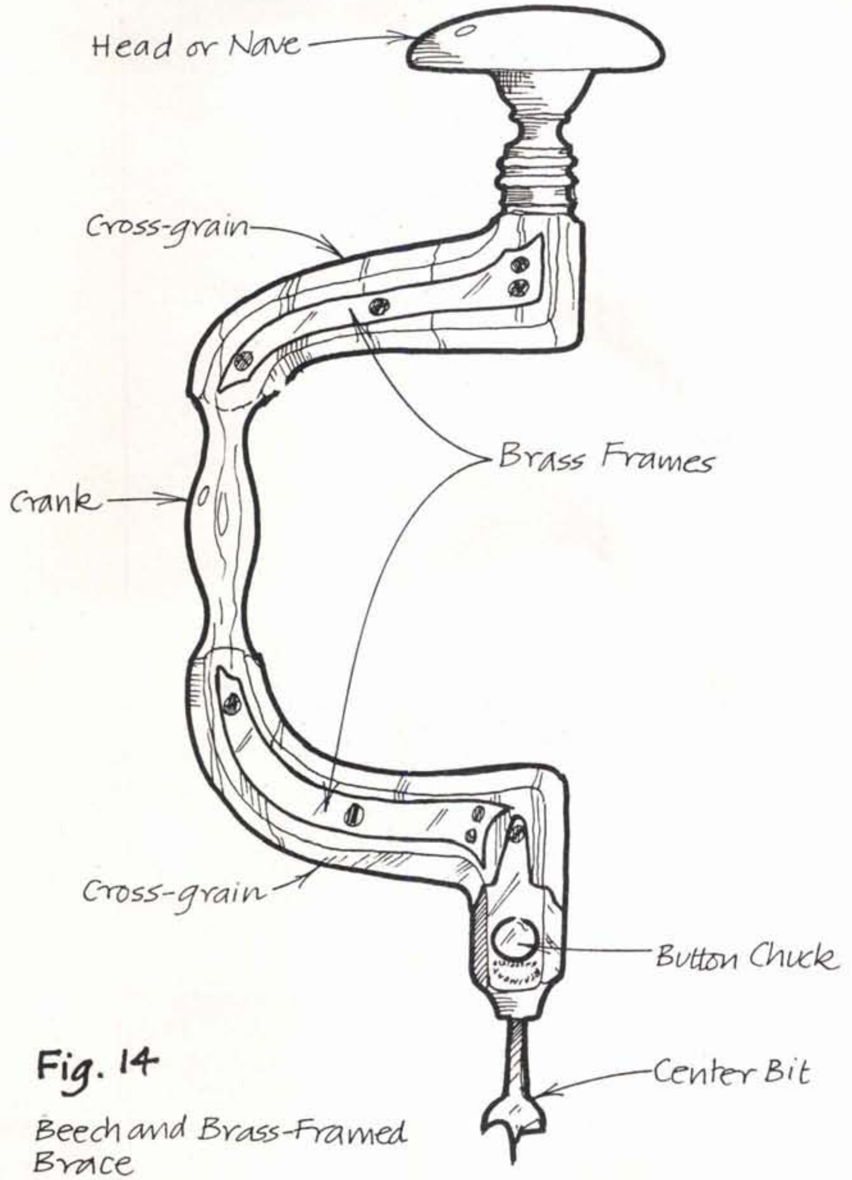


Fig. 14

Beech and Brass-Framed Brace

More to the point of this article are the variations that were made on the metal versions that followed (see Figure 15). Although it is the very sweep of the crank which gives the brace its power (and the larger the sweep, the greater the torque and therefore the easier it is to bore a hole), this very crank sometimes operates to the tool's disadvantage by being in the way in narrow quarters. To overcome this problem most modern braces are fitted with reversible ratchets, which allow the tool to be rotated through only a part of its full circle. Sometimes even this is inconveniently restricting and so the corner brace (see Figure 16) was devised. With this tool the bit can be presented to the area to be bored at such an angle that the operation of the crank is not interfered with.

A further refinement of this idea is the angular brace extension. This is clamped into the brace's chuck and by means of a universal joint, adjustable to any desired angle. The bit, which is then fixed in the extension's chuck, may be used in almost any position.

A similar idea, but not strictly a brace since there is no crank, is the so–called hand ratchet brace which looks exactly like a large auto mechanic's ratchet fitted with the typical woodworking brace's head (or nave, as it is more properly known).

The subject of braces deserves an article to itself, as does a discussion of all the various bits that may be employed with them and with other boring tools, but for the moment it should be obvious that drilling tools are far from boring. PW

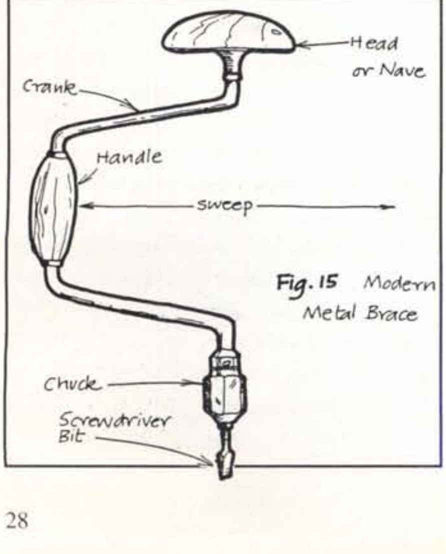


Fig. 15 Modern Metal Brace

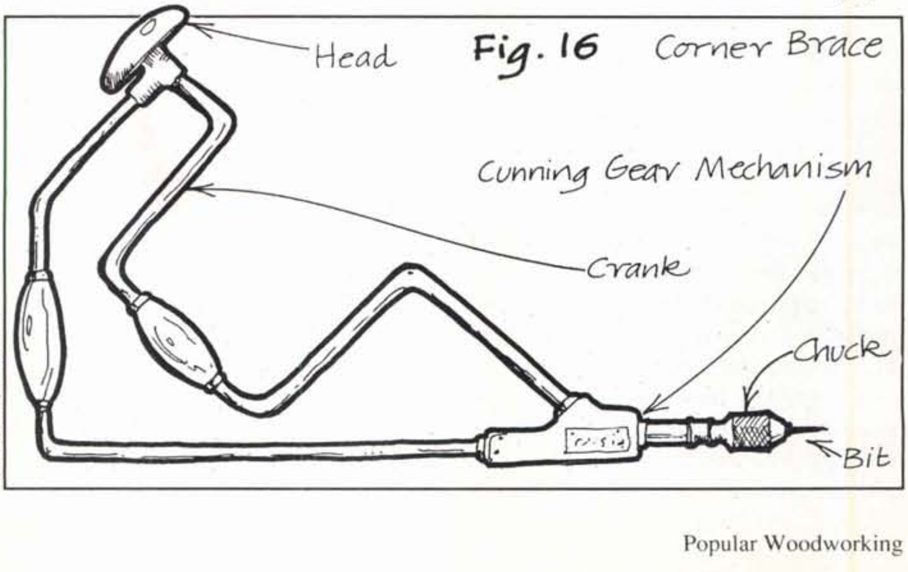


Fig. 16 Corner Brace

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Ed Moulthrop

photos by the author

The

by Hugh Foster

Stephen Hawking, the famous contemporary British astrophysicist says, "One is who one is because of what one does." I'd like to add to that notion by pointing out how much better one performs when one loves what one does. If ever there were such a man, a lover of what he does, it would be Ed Moulthrop—perhaps the world's preeminent turner of large bowls. I've met few people who were as perfectly pleased with who they are and what they're doing.

While I was in Atlanta this summer, I went to visit Ed Moulthrop at his studio, hoping to learn something about sharpening. He suggested that his tools are so "non–standard" that he might not be able to help me much with that, but he said he'd be delighted to show me what he could. He showed me much, much more than I bargained for.

Ed Moulthrop is a pretty laconic fellow who works at a steady, but relaxed, pace. The peace in his shop is remarkable—Moulthrop's serenity is such that he appears to have found nirvana in his work. His specialty is turning large—and I mean very large—objects from wood. He makes it look so simple, but of course, it's not.

In *Master Woodturners* (Provo, UT: Artisan Press, 1985) author Dale Nish reports that Moulthrop doesn't feel there is any social or moral message in his work, except to say that a greater craftsman than himself placed the beauty in the log. Don't let this suggest to you that Moulthrop's work is undisciplined, for work of this magnitude (here meaning

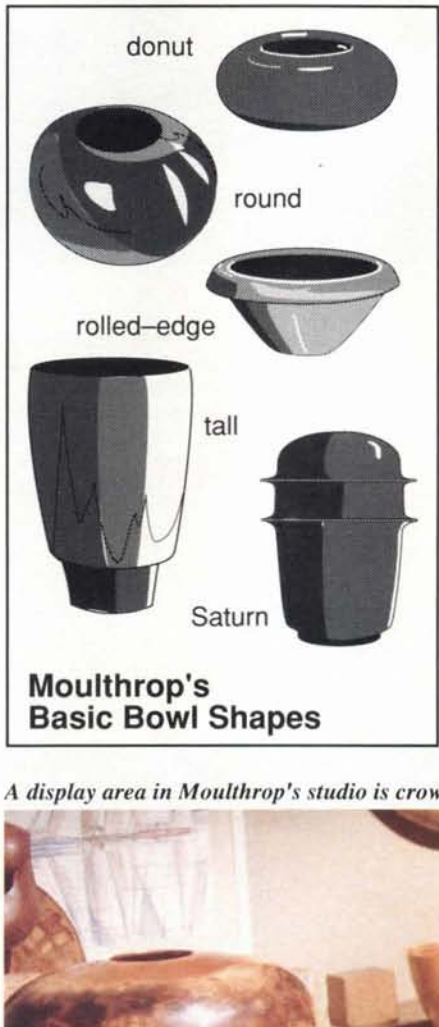
***Hugh Foster** is a furniture designer/builder in Manitowoc, Wisconsin who occasionally enlists the help of his 4th period expository writing class to get his articles in on deadline.*

Birth of a Bowl

"sheer physical size") couldn't possibly be done—and done ever more beautifully—without great discipline. Moulthrop's training as an architect has undoubtedly helped to hone the vision that has shaped his craft into an art. His work is evolutionary—that is to say, it developed naturally over the years rather than through expressly experimental techniques. Rather than "mess" with the whole concept as so many of us do, Moulthrop works continuously to refine aspects of it, and refine those aspects nearly to perfection before moving on to another aspect. His commitment to what I can only call "The Moulthrop Style" has been consistent and ongoing: His five basic designs are illustrated at right: the donut, the round, the tall, the rolled–edge, and the Saturn. Each, no doubt, has had some evolutionary variations. The chalice on our front cover is the newest of the Moulthrop designs (so far, he's only made the one)—and it is clearly evolutionary, a combination of the other shapes, yet radically different enough to serve as the exception that proves the rule.

A standard "round" bowl is about 1/8" thick at the opening, tapering gradually to about 3/4" nearer the base. This is really awfully thin for an object which can sometimes be over three feet in diameter. Making such a bowl requires more than just a vision.

One of the reasons Moulthrop's bowls seem so simple is that he believes that beautiful woods demand simple shapes, and he prefers to let the beauty of the wood shine through. To many of us, that means seeking out the rarest possible woods, but if we do so, we make some contribution to the deforestation of tropical regions and the concomitant destruction of the ozone layer (even if we figure, "What can this small amount of this beau-



Moulthrop's Basic Bowl Shapes

illustration by Jeffrey Burr

The Saturn Bowl

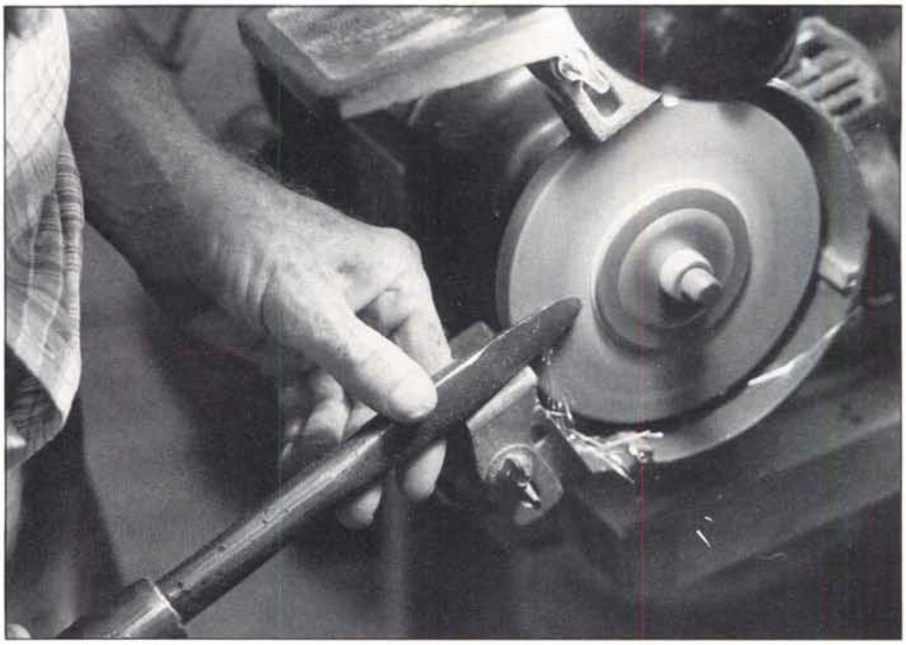
A display area in Moulthrop's studio is crowded with examples of his art.

tiful wood matter to that forest?"). Moulthrop doesn't bring up these subjects, but his beliefs about the matter become readily apparent to one who looks at his work: There are no rare woods here. Instead, southern pine, tulip poplar, sweet gum, persimmon, black walnut, wild cherry, soft maple and other woods common to southeastern United States are the treasures of his choice. Additionally, Moulthrop's wood specimens are often gathered after storm cleanup. If the by–product of local storm damage is good enough for an artist like Ed Moulthrop, do the rest of us really need Andaman padauk or bubinga for our projects?

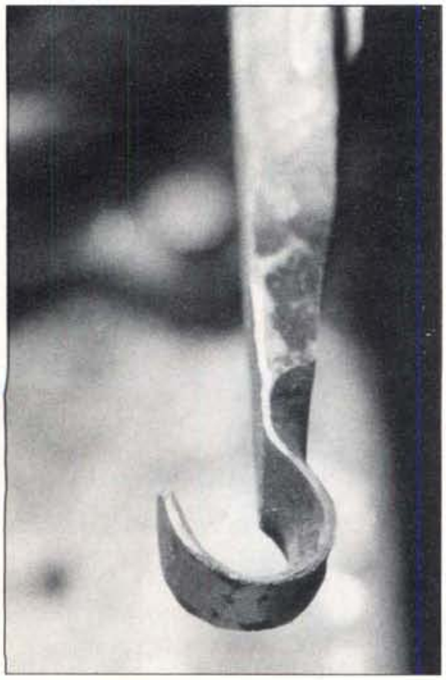
His techniques for storing the wood are conducive to spalting, so even this little understood rotting process contributes to the beauty of his work. The 1988 summer drought was well upon us when I visited, and Moulthrop was concerned that his collection of turning blanks would dry out too much in storage. The wood must be green as he first turns it, so he devoted a real effort to hosing it down to keep it damp.

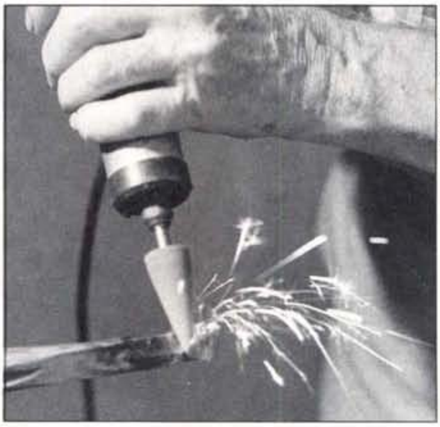
The Tools

Moulthrop's work is turned with only three tools before it is disk–sanded, then hand–sanded from 36 through 100 grit, and then finish–sanded in ever finer steps as the lacquering process proceeds. Again, I must use the term evolutionary to describe these three tools. The typical



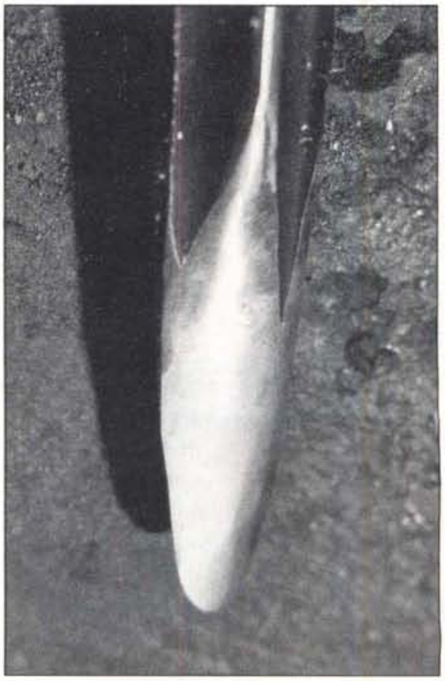
(Above) Moulthrop sharpens his lance to a spear point on the side of the grinder. (Right) Final honing is done with a slipstone. (Below right) The sharpened lance.





photos by the author

(Left) The hook presents the shape of a gouge to the wood at an angle a gouge could never duplicate. (Above) The bevel is ground on the inside of the hook with a conical stone in a die grinder.



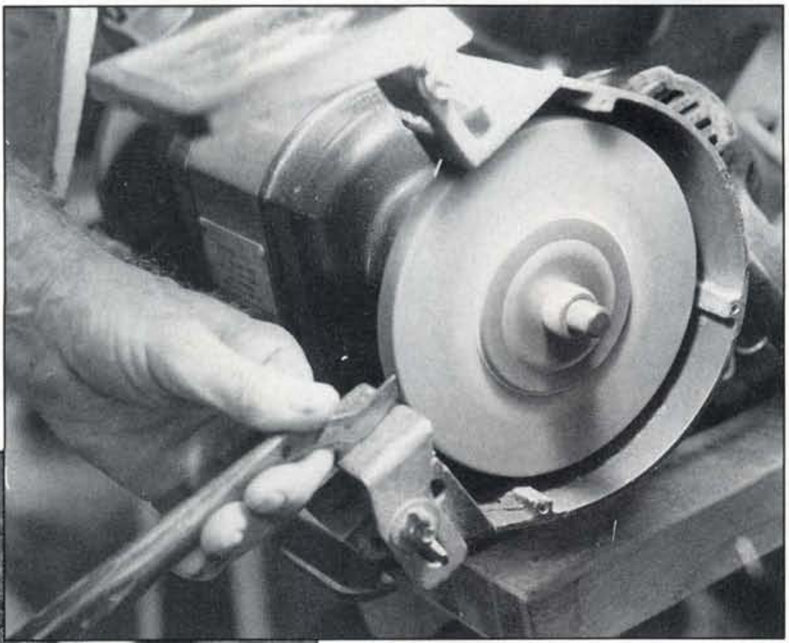
eight–piece set of turning tools with which most of us are familiar has no place in his shop. He forges his own.

Moulthrop's bowl loop is derived from the turning loop used in colonial times. Its ring–shaped cutting edge cuts the way a gouge would, if its edge were set at about 90° to its traditional position; at this angle, it can't scrape. The bevel is ground on the inside of the loop with a die grinder. As the tool evolved, it became offset just enough to fit in the 1-1/4" hole Moulthrop drills in each blank to establish a bowl's depth.

Like all his tools, Moulthrop's external cutting tool, the "lance" is forged from salvaged taper taps. It is basically a spear–pointed tool, sharpened in a pretty standard fashion. It is presented to the wood at about 45° to ensure cutting rather than scraping, and typical shavings removed from green wood are 5/8" wide and 1/8" to 3/16" thick. Of course, the rough–turned stock looks very rough indeed, but later stages of the operation will correct that. The first cuts remove 1-1/2" or so of wood just to make the stock cylindrical.

His cut–off tool features an offset cutting edge located lower than the tool rest to prevent it from being rolled over as it cuts.

You have to understand that Moulthrop's tools make standard "store" tools look positively diminutive; he finds even large commercial tools like the Stocksdale or Superflute gouges to be too small for his work. Moulthrop's shop–forged tools literally dwarf these; they range from 4' to 8' long, and his largest weighs in at just over one hundred pounds.



(Left) Moulthrop's version of a parting tool is off set so that it cuts below the tool rest. (Above) It is ground on a regular grinding wheel.

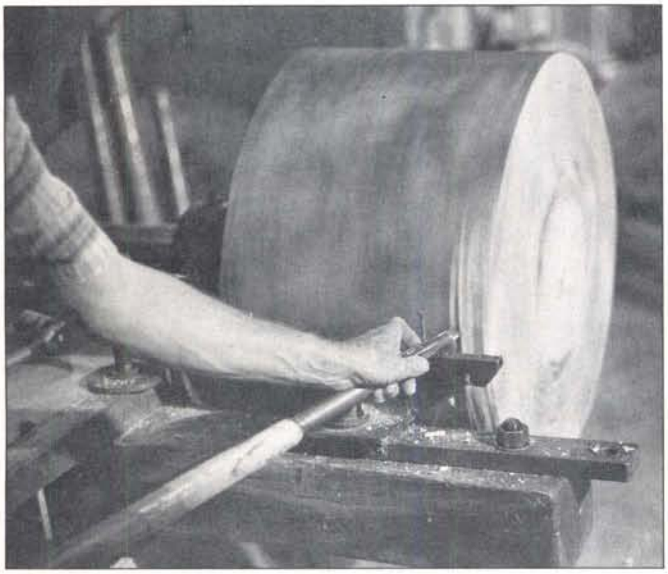
The large tools help prevent the chatter and vibration inherent in a cut to the bottom of a three– or four–foot–deep bowl, but they're too heavy to work "by hand," so he mounts the butt end of the tool in a heavily weighted, free–rolling stand which is the correct height for turning. This prevents his having to "horse" the tool, which in the case of a hundred–pounder is likely impossible anyway. A cam–action clamp holds the tool at the correct height in this rolling stand.

The other end of the tool rides against a peg (a concrete nail) set in a hole in the tool rest. Why? Sometimes he's turning against wood that's as much as four feet away from the tool rest, and the tool must be supported somewhere.

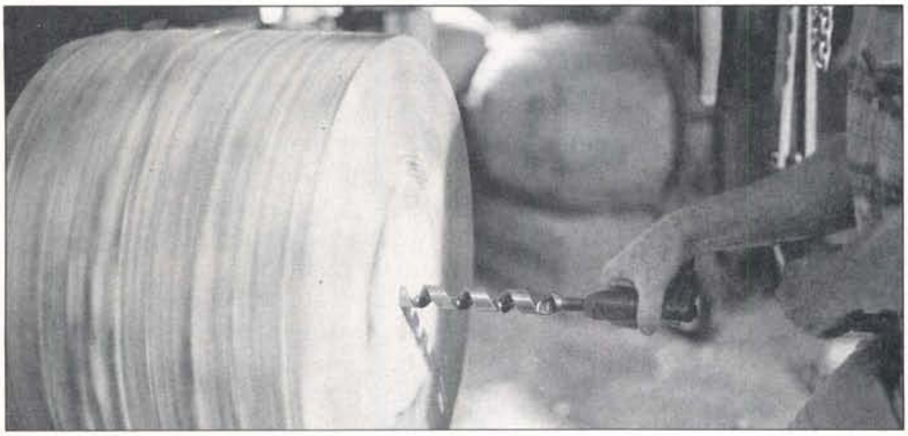
Without this collection of tools, the process, as Ed Moulthrop knows it, couldn't be done. Just as the birthing process in humans is the culmination of months of effort and slow change, producing the bowl couldn't be done without all the above givens—and, of course, we've yet to mention the ineffable Moulthrop difference: His work is art, not merely craft.

Sharpening is but craft, and the tools must be sharp. This artist is so handy with a die grinder that he can free–hand sharpen the outside of the lance, the cut–off tool, and the inside of the loop with it. An ordinary bench grinder is actually preferable for all but the loop which must be done with a die grinder and a conical stone. On the loop the honing step is omitted; even so, sometimes a single grinding is good for a whole day's cutting—or even more. Only the lance requires hand honing.

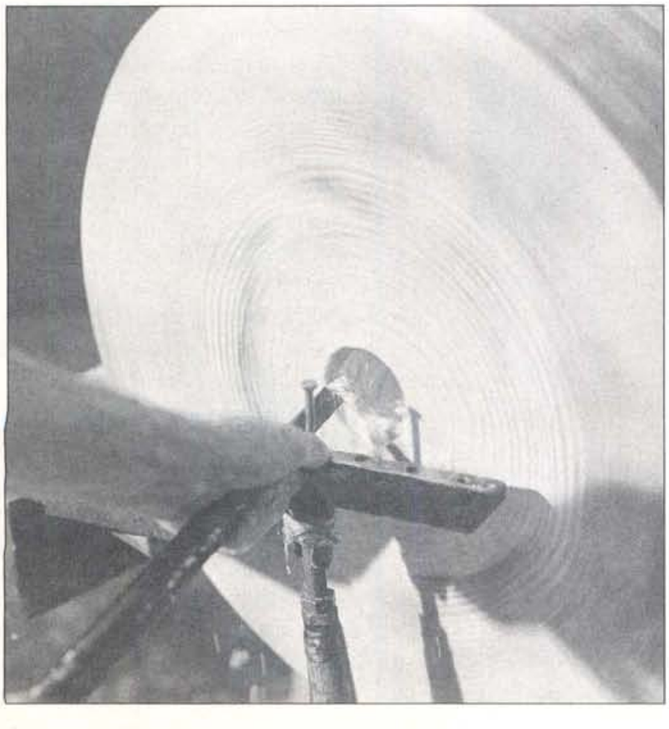
It takes a mighty lathe to spin the logs from which Moulthrop makes his bowls, so he has designed and built his own. He uses one lathe for the rough turning and another for finishing. The visible difference between them is the great dust hood on the finishing/sanding lathe. The bases of the lathes are made of plywood, using aircraft construction techniques; a simpler "screwed together" assembly would simply shake apart under the strain. The business end of the lathe is threaded to accept shop–made faceplates made from gears found at the salvage yard. The lathe's 3" diameter shaft is supported in



(Left) Moulthrop uses the lance to round the outside of the bowl. A cement nail provides added support for the tool.



(Above) A 1-1/4" ship auger establishes the depth of the bowl. Moulthrop places the tip of the bit against the spinning blank and its rotation draws the auger to the center. The bit must be withdrawn frequently to clear the chips and keep it from being grabbed.



(Left) Here the cement nail peg acts as a fulcrum providing leverage for the hook as it removes wood from the center.

two very large pillow blocks, and the other end features double–belted pulleys that are driven by a 3 horsepower motor at speeds of 50–125 RPM. The motor is controlled by a foot switch.

The lathe's tool rest is bolted to a heavy timber of cherrywood; it takes a 3/4" drive socket wrench to secure it for work this big. An add–on leg provides additional support when turning at the front of the blank. The tool rest proper has holes at 2" intervals for positioning the cement nail peg.

The Procedure

Despite the fact that a turning blank is likely to weigh upwards of 500 pounds, Moulthrop's handling of it looks awfully easy. His wood storage area is uphill from his shop, so he can roll each turning blank (or should I be saying "log"?) down to where he removes the bark; then he rolls it through an overhead door into his rough–turning shop. Here he locates the center, carefully measuring so as to avoid wasted effort later in the project, and bolts the faceplate to it about as quickly as I can describe it. Next, he picks it up with a motorized winch and guides it to the business end of his lathe. Practice has made him so expert at this that the process appears to require almost no effort.

With the stock mounted securely on the lathe, Moulthrop sets the tool rest roughly parallel to the outside of the bowl he's about to turn. He removes an inch or so of material to ensure that the blank is, in fact, round, all the while removing much of the cambium layer of the tree which would otherwise be the first part of the bowl to decay.

Without ever having to turn the lathe off, Moulthrop exchanges his lance for a 1-1/4" ship auger, determines "by eye" how deep he will have to drill, marks the bit with a piece of masking tape, and walks around to the front (top) of the bowl. He sets the bit slightly askew to the surface, near the center, and the bowl's rotation walks it to dead center. Then he aligns the bit square to the surface and sets his hip against the brace to begin drilling. The drilling goes very quickly even though it's necessary to withdraw the bit frequently to make sure the chips are ejected; otherwise the bit would quickly become locked in and lost forever along with the blank.

After drilling the hole, Moulthrop stops the lathe and puts the tool rest in place. If clearing out the inside of the bowl is to take more than just a short while or if it is to involve using one of the very largest of his bowl loops, the tail end of the tool is set in the rolling stand mentioned earlier. Once the tool has been cam–clamped into this stand, it will always be parallel to the floor. All Moulthrop has to do is "steer" the tool. This is important for the long periods of time it takes to hollow a bowl of Moulthropian magnitude. In a really large bowl, this cutting could go on for days.

After rough–turning the green wood, a three–month soak in polyethylene glycol (PEG) displaces the natural moisture in the wood so that it will be stabilized for its final turning. Moulthrop has nearly a dozen vats of PEG—all exceeding 100 gallons, a couple of them being four feet in diameter and at least three feet deep. In his southern climate, solar energy heats the vats all year 'round.

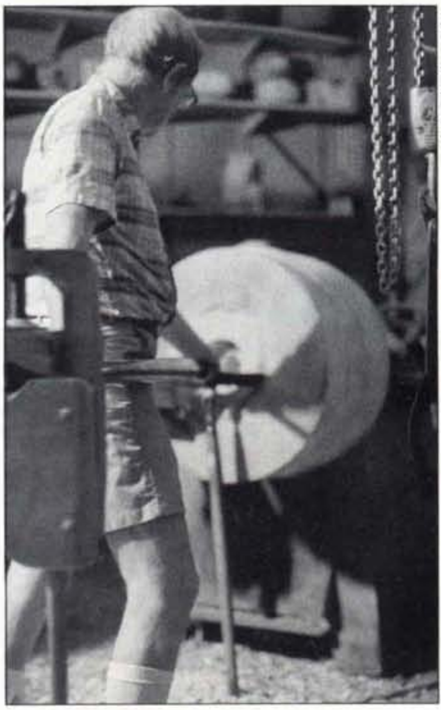
For the sake of variety and interest and for the sake of moving things along, Moulthrop always has a fairly large number of bowls at each stage of the process; switching from task to task adds variety to his workday, and ensures that he doesn't lose time to "just waiting."

So what I witnessed that day was the birth of a bowl. What I learned far transcends the factual information about sharpening and turning that I went there seeking.

Ed Moulthrop is a little like a kid in a candy store: In his own shop—even after these many years of experience—he is perpetually delighted. He forever wants to see how he's doing, so he previews the approximate results often, "painting" his bowls with quick–dry solvent to admire the grain. While some of this undoubtedly has to do with saving time, rather than wasting it on nearly completed bowls that just won't be worth the effort, I'm sure that Keats' notion "A thing of beauty is a joy forever" plays an even greater part, for Moulthrop finds great joy in his shop. If he didn't seem to love life in general so very much, I'd suggest there is nowhere he'd rather be. PW

Moulthrop likes to have several pieces in various stages of completion at any one time. Above, stacks of bowls await finishing.

Not content to wait until he's finished, Moulthrop keeps a jar of lacquer thinner handy so he can paint the wood with it and preview the striking grain pattern, such as that of the ash–leaf maple piece shown here.



photos by the author

(Left) A heavily weighted tool stand clamps the end of the tool handle, dampening chatter and relieving some of the burden of controlling the large tool against the large spinning timber.

Ash

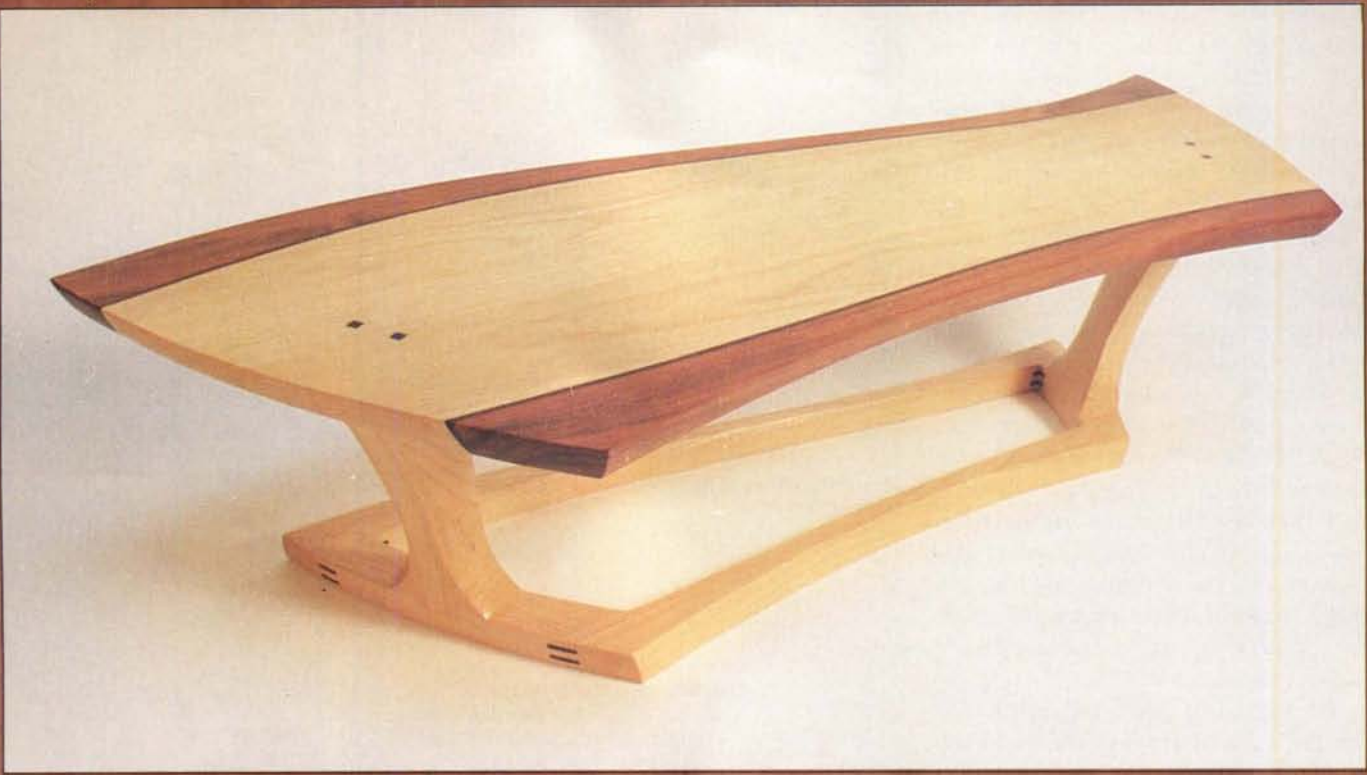


photo by Jon Seeman

The ash in Jon Seeman's coffee table is bleached to enhance its contrast with the koa border.

by S. Reed Poverny

What does ash make you think of? Yellow and purple autumn leaves, perhaps? A baseball bat in the closet? Maybe that handle on the rake in the garage. And aren't those old wooden skis that decorate the wall made of ash? Lightweight, elastic, and tough, ash seems to have innumerable applications—including fine cabinetry.

Man has known of ash since before recorded history, when he fashioned the wood into ax handles during the Stone Age. According to ancient Norse mythology, in fact, man himself was created from an ash tree.

Some 70 species of ash exist on the planet, most in the northern temperate zone of North America, Europe, and Asia, some in Mexico and Java. 18 species are found in the United States.

S. Reed Poverny is a wood researcher, woodworker and photographer. His work in a specialty lumber store has given him first-hand knowledge of domestic and exotic woods.

General Description

A description of ash is necessarily general, since it varies markedly in color, density, and strength depending upon where and how it grows. A tough, slow–grown northern ash can become a baseball bat, while the same species from southern bottomlands may be "so punky and soft you can break it over your knee," to quote one supplier.

Like chestnut and pecan, ash is a "ring porous" wood, meaning it is composed of distinct layers of soft, porous spring growth and hard, dense summer growth. It is this balance of two seemingly opposing qualities that gives ash its resilience, and its ability to absorb repeated sharp blows without splitting. Hickory shares these characteristics with ash, while being even more tough and shock resistant. Ash's advantage is that it is lighter in weight. It is also less expensive.

The creamy white sapwood of all species is susceptible to insect damage.

Being both tough and forgiving, ash was well suited to the demands of wooden wagons and wheels. Felloes, the shock-deadening members of the wheel's outer rim, were nearly always made of ash.

photo by the author

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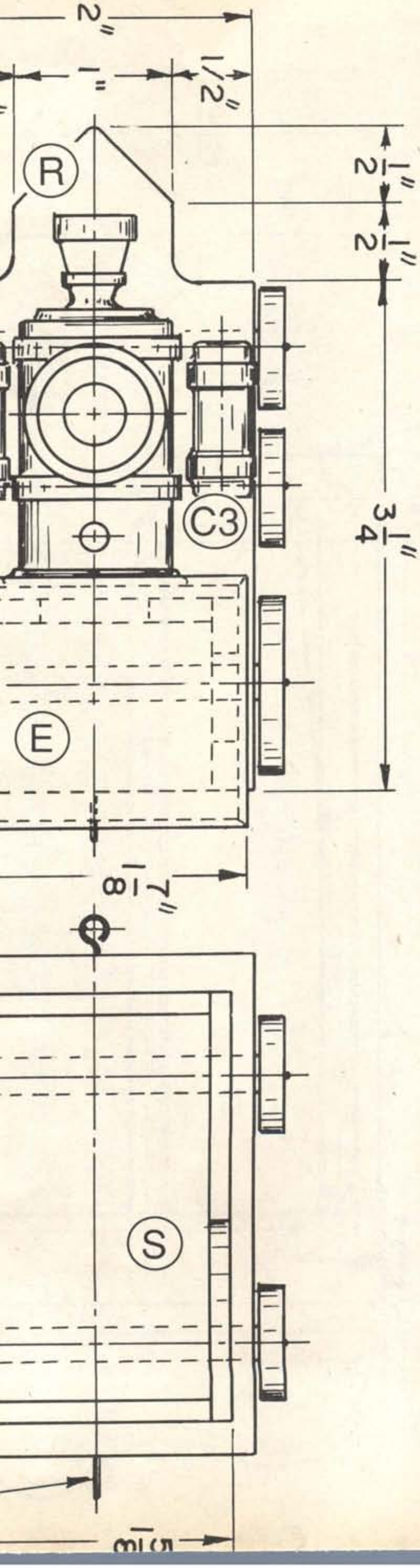

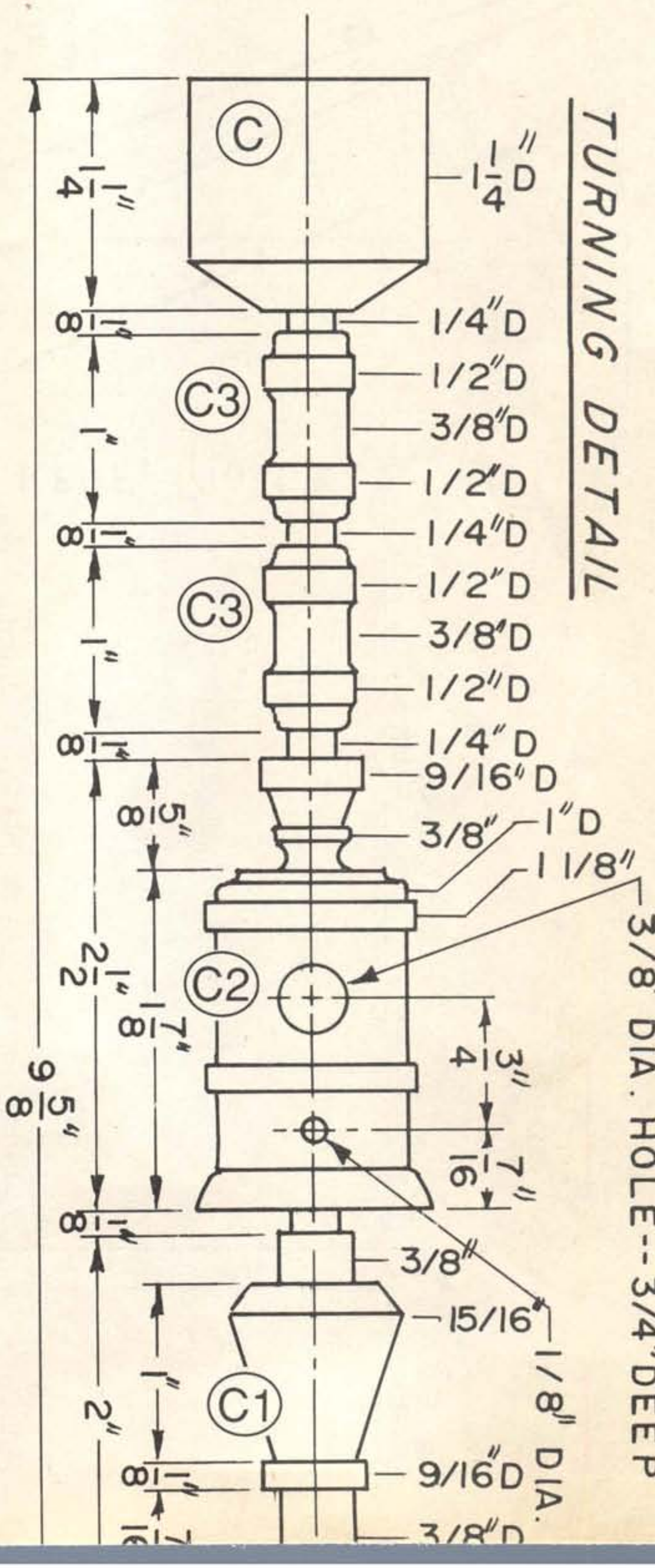

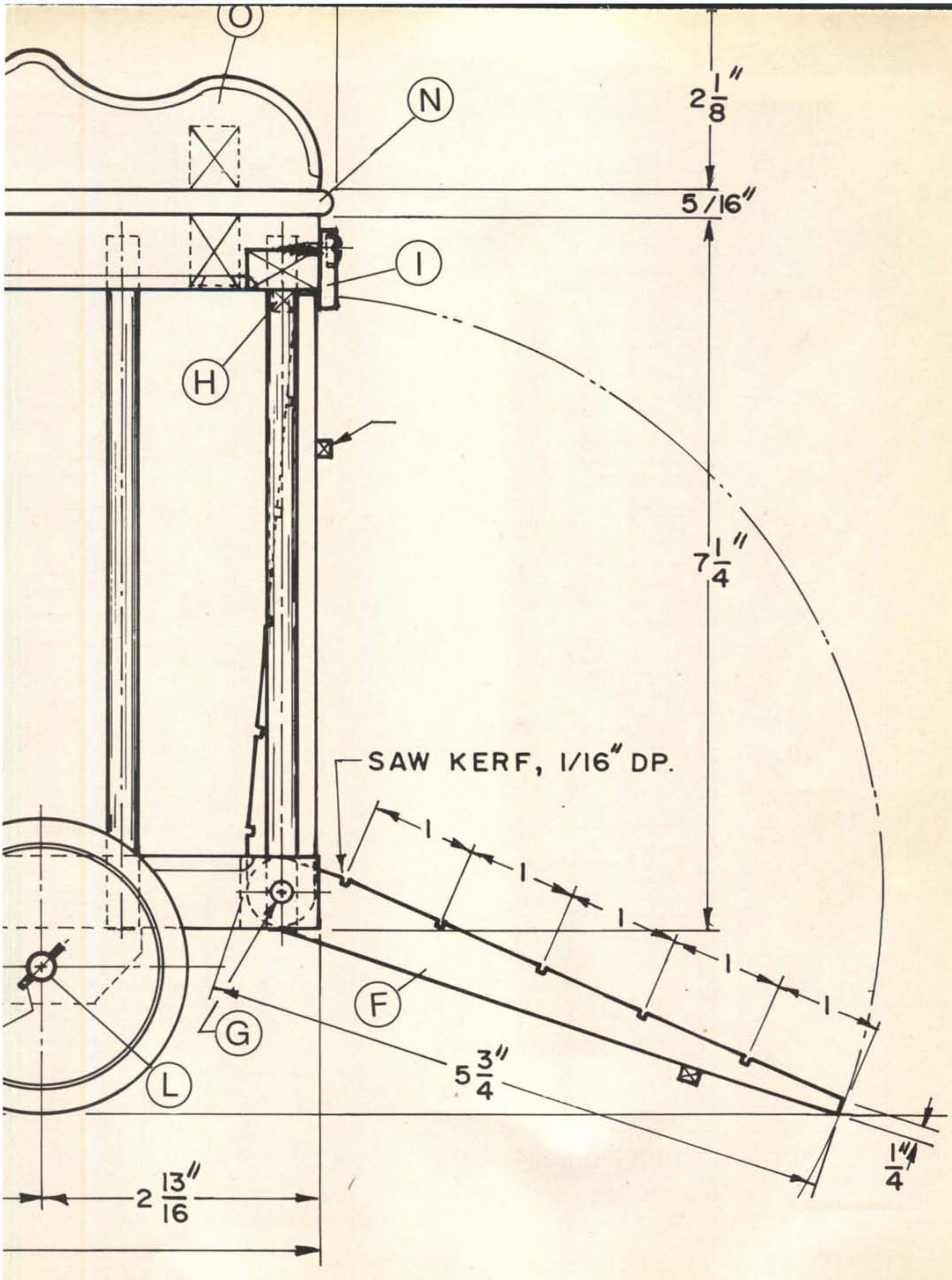
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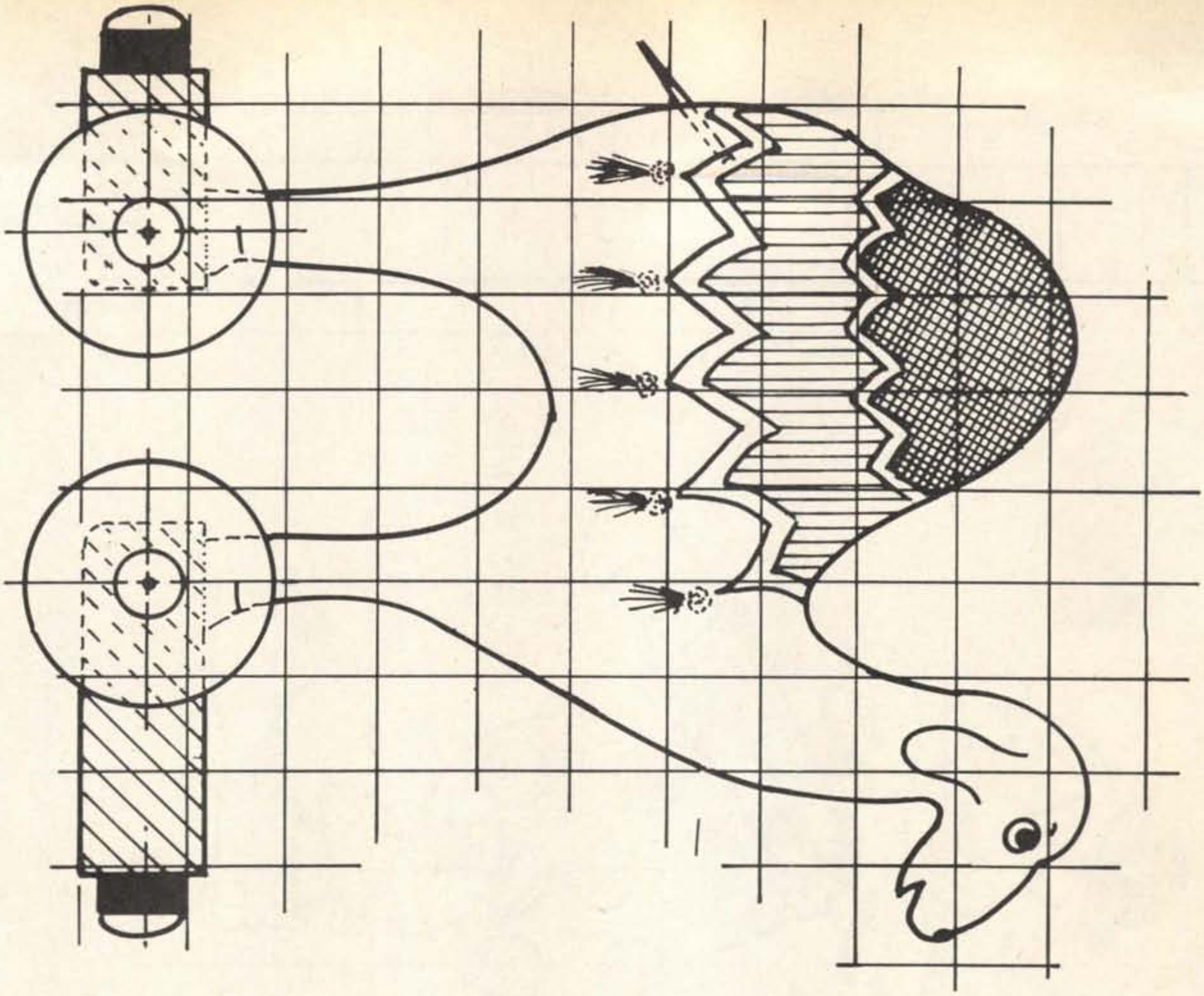
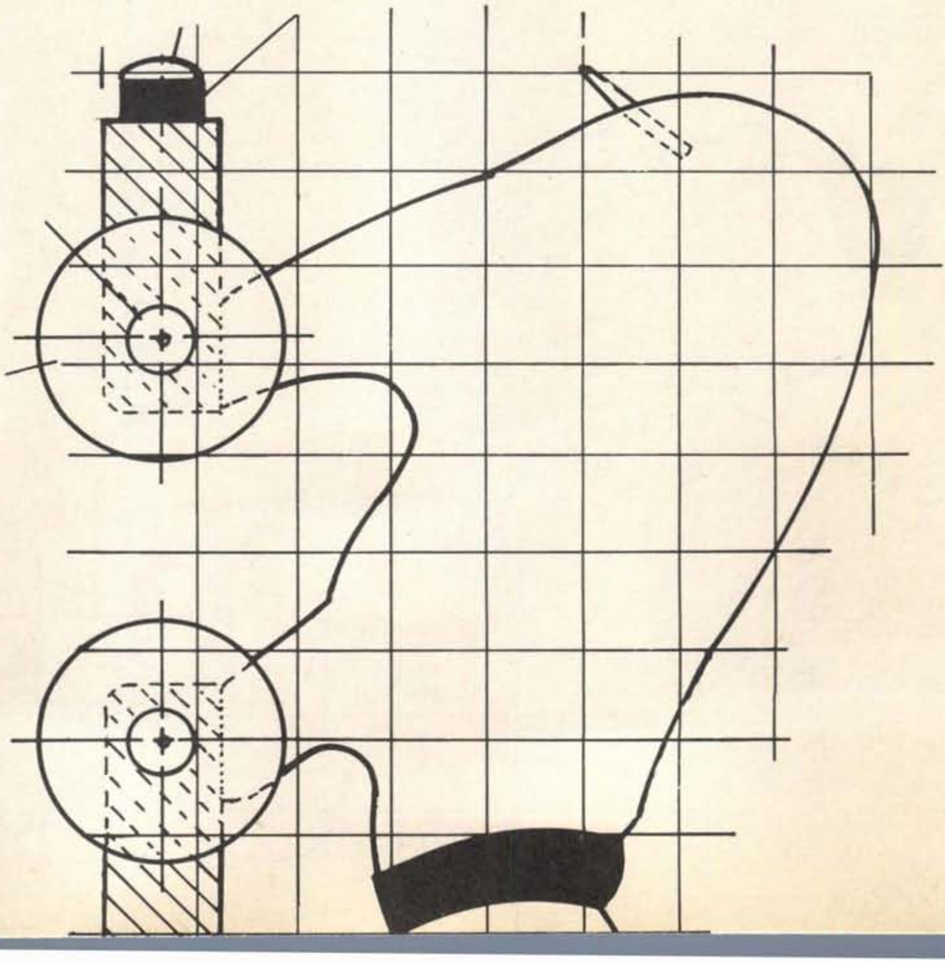
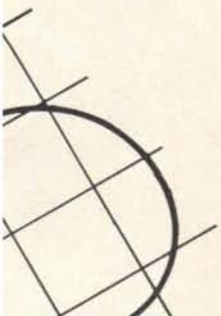
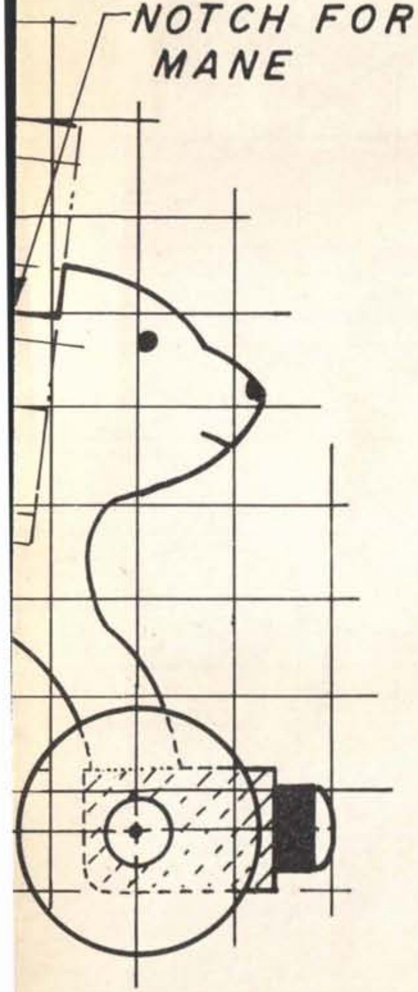
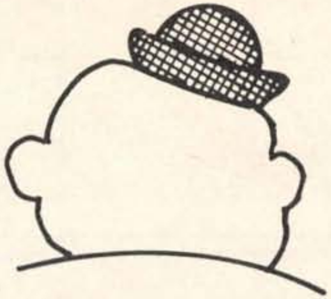
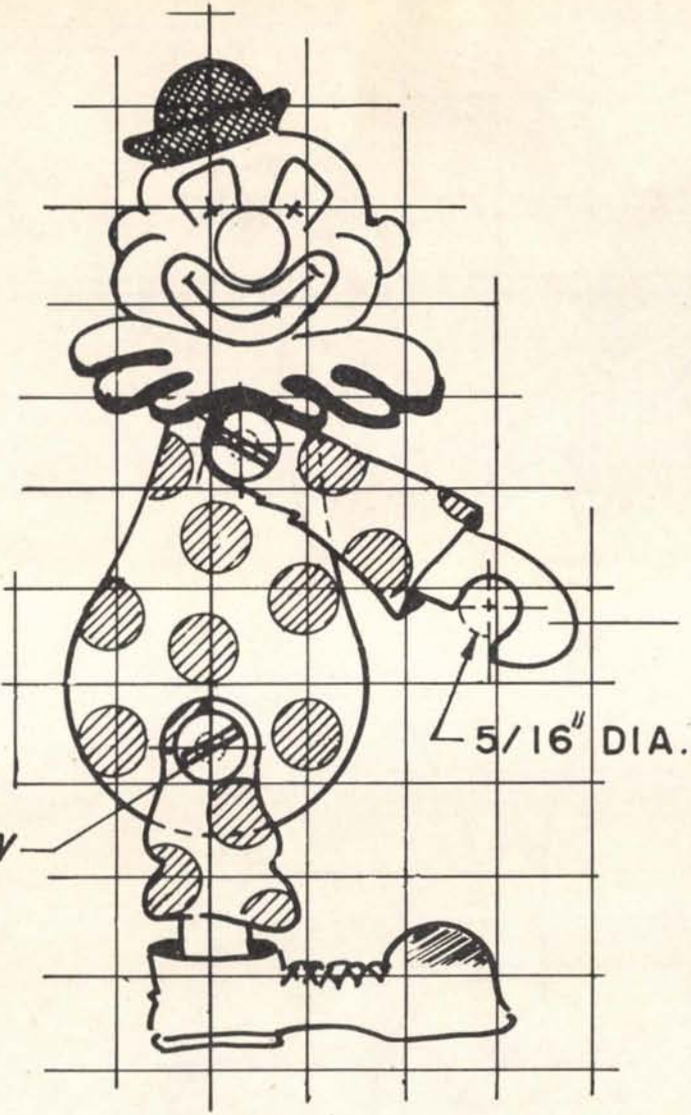


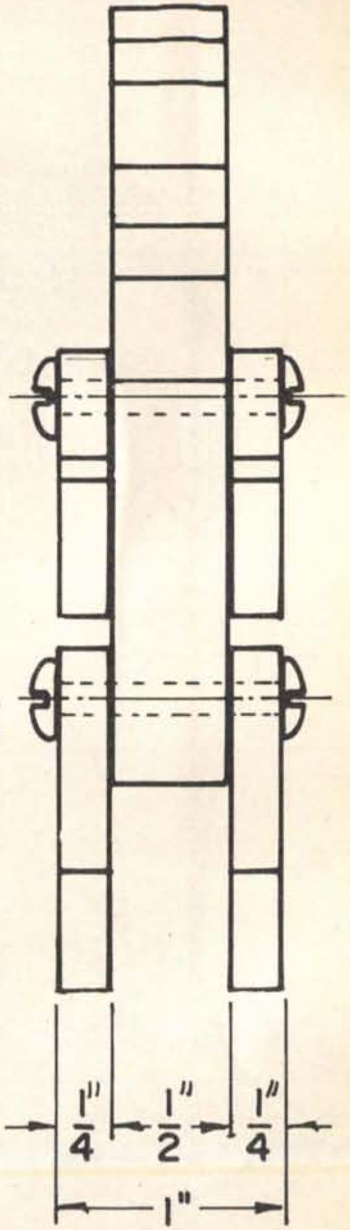




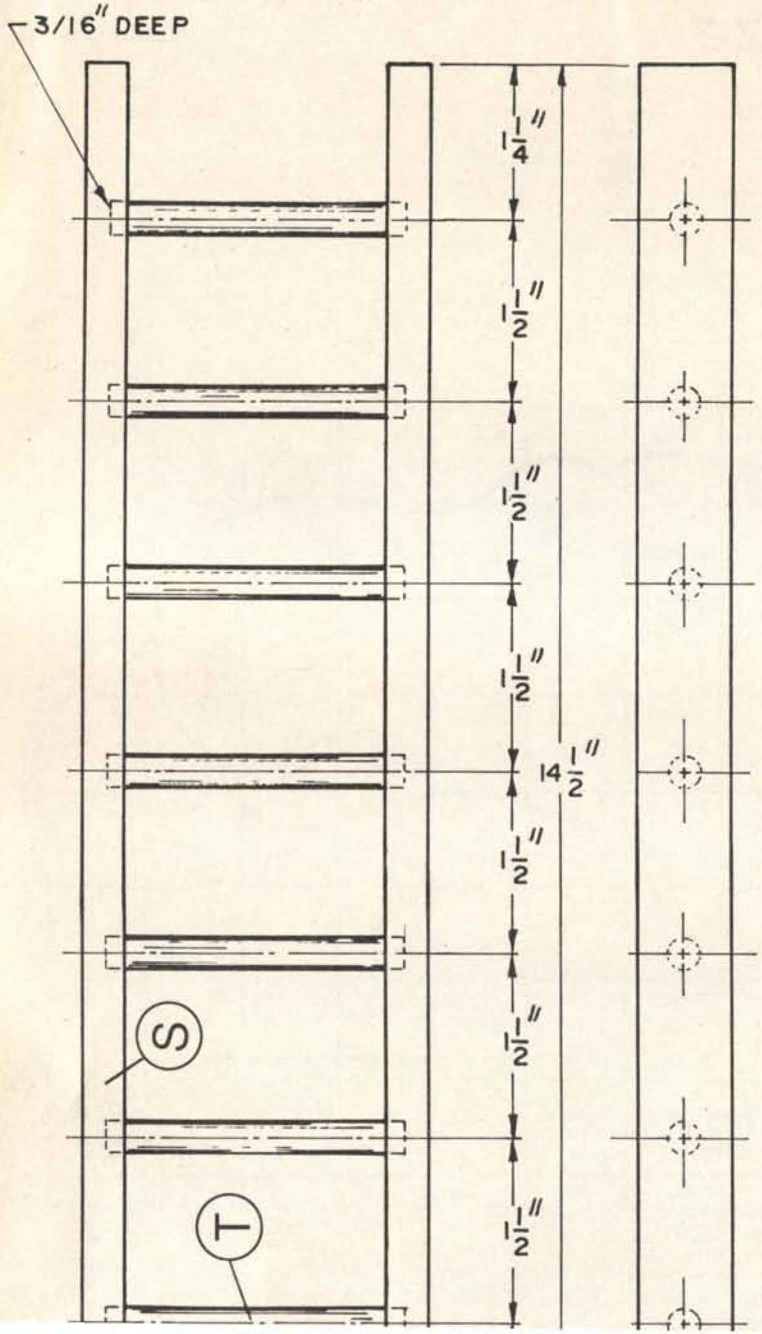


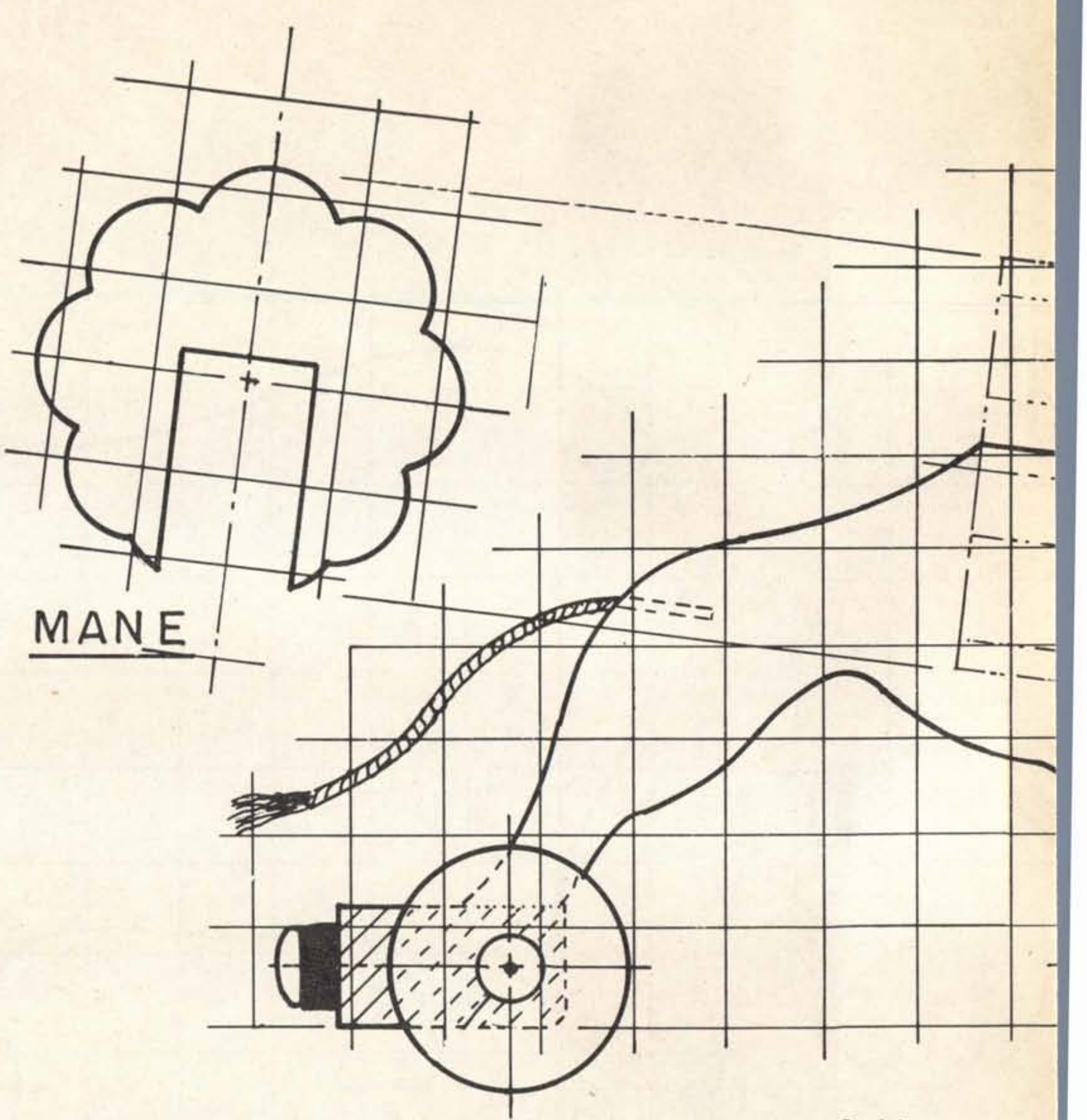

BACK VIEW OF HEAD





FRONT VIEW

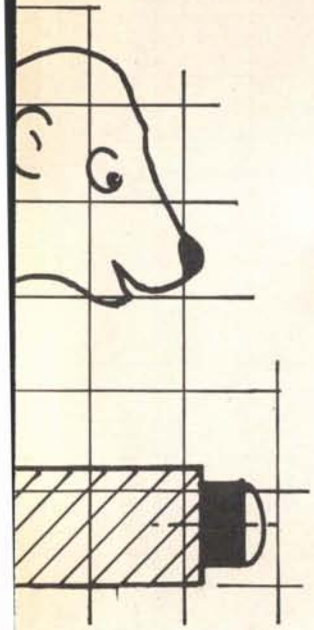

3/16" DEEP
$1\frac{1}{4}$"
$1\frac{1}{2}$"
$1\frac{1}{2}$"
$1\frac{1}{2}$"
$14\frac{1}{2}$"
$1\frac{1}{2}$"
$1\frac{1}{2}$"
$1\frac{1}{2}$"
S
T

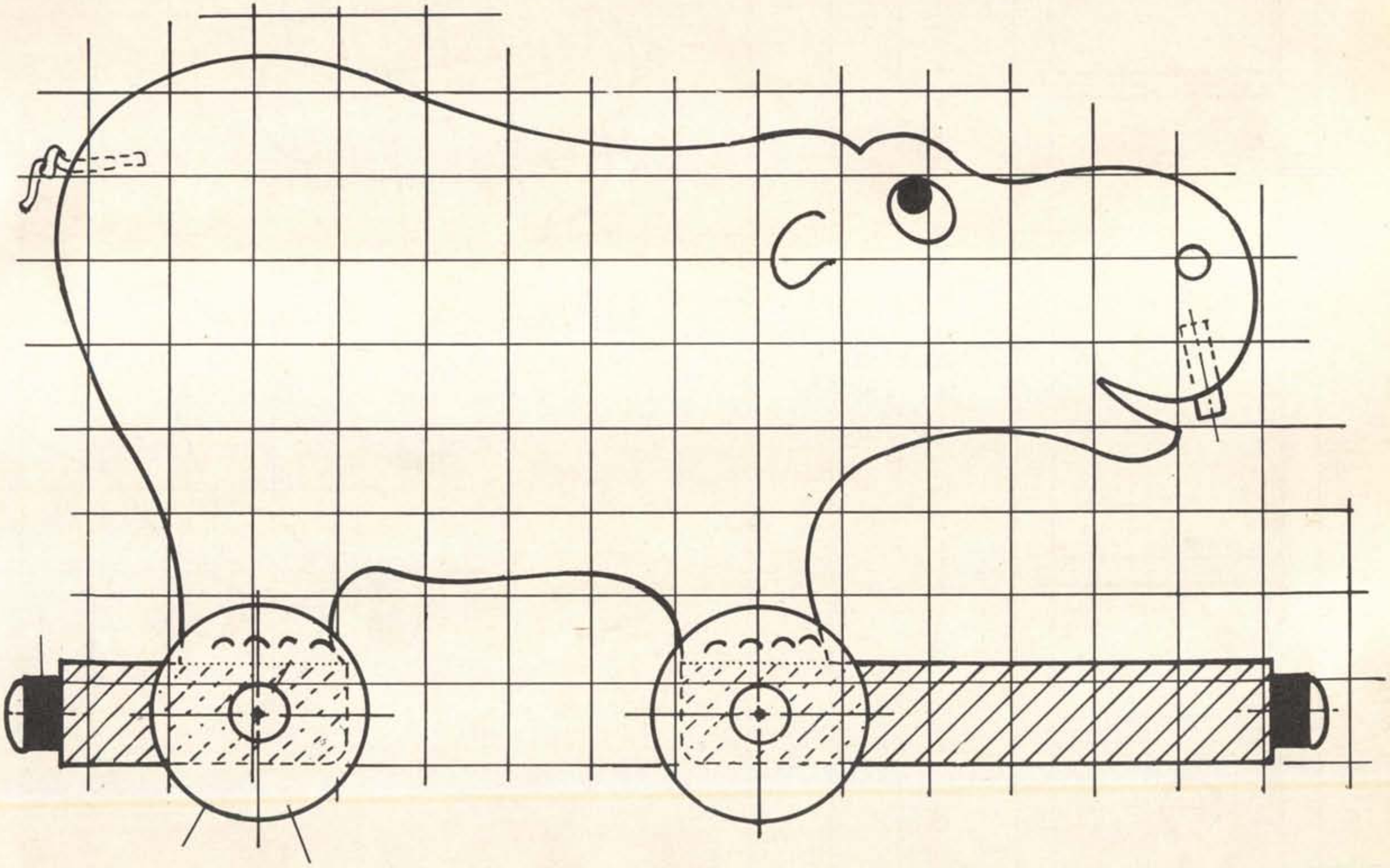


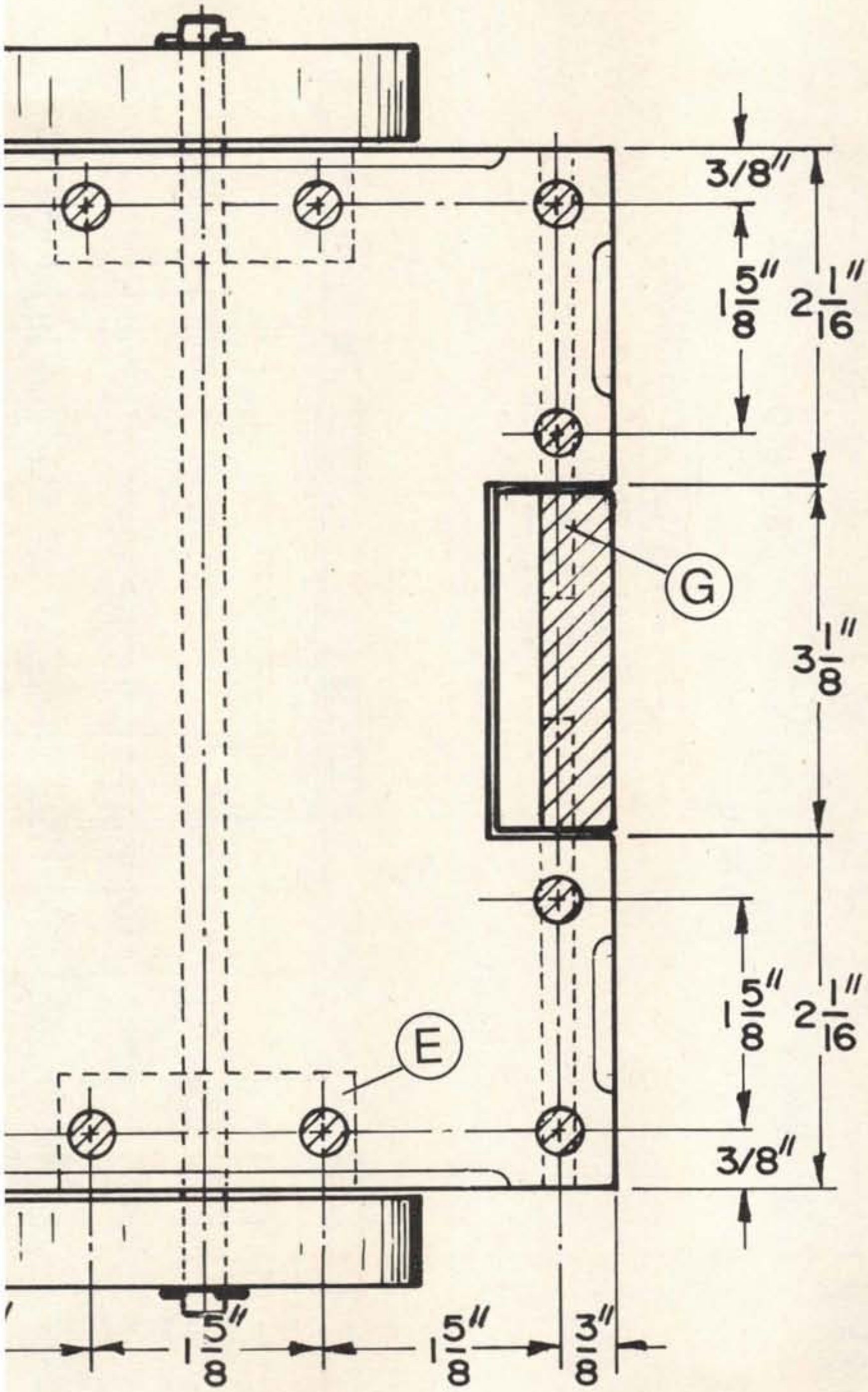
MANE

LION

Full Size







The Greatest Show on Earth

Cutting List

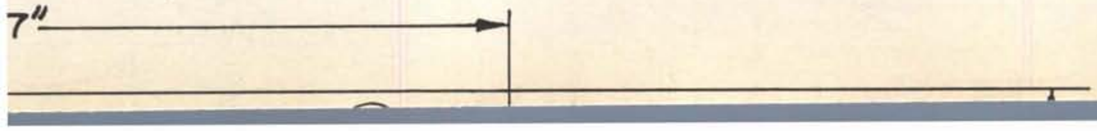
		Finished Size			
Qty	Part	T	W	L	Piece
1	A	3/4"	7 1/4"	13 3/4"	base
2	B	3/4"	3/4"	13 3/4"	long top supports
2	C	3/4"	3/4"	7 1/4"	short top supports
23	D	5/16" diameter		7 1/8"	bars
4	E	3/4"	3/4"	2 1/4"	axle supports
1	F	3/4"	3 1/16"	5 3/4"	ramp
2	G	3/16"diameter		3"	hinge pins
1	H	1/4"	1/4"	3 1/4"	ramp stop
1	I	3/4" diameter		1/4"	ramp lock
1	J	1/4"	1/4"	1"	ramp handle
4	K	5/8"	2 7/8" diameter		wagon wheels
2	L	3/8" diameter		9"	axles
4	M	1/8" diameter		3/4"	cotter pins
1	N	5/16"	7 1/2"	14"	top
2	O	9/16"	*2 1/8"	*13 3/4"	top trim pieces
1	P	5/16" diameter		8"	ladder support pin
4	Q	3/4"	5/8"	6"	trim supports
2	R	3/4"	5/8"	5 3/4"	aligning boards
4	S	3/4"	3/8"	14 1/2"	ladder posts
18	T	1/4" diameter		2 1/2"	rungs
32	U	1 1/4" diameter		5/16"	animal wheels

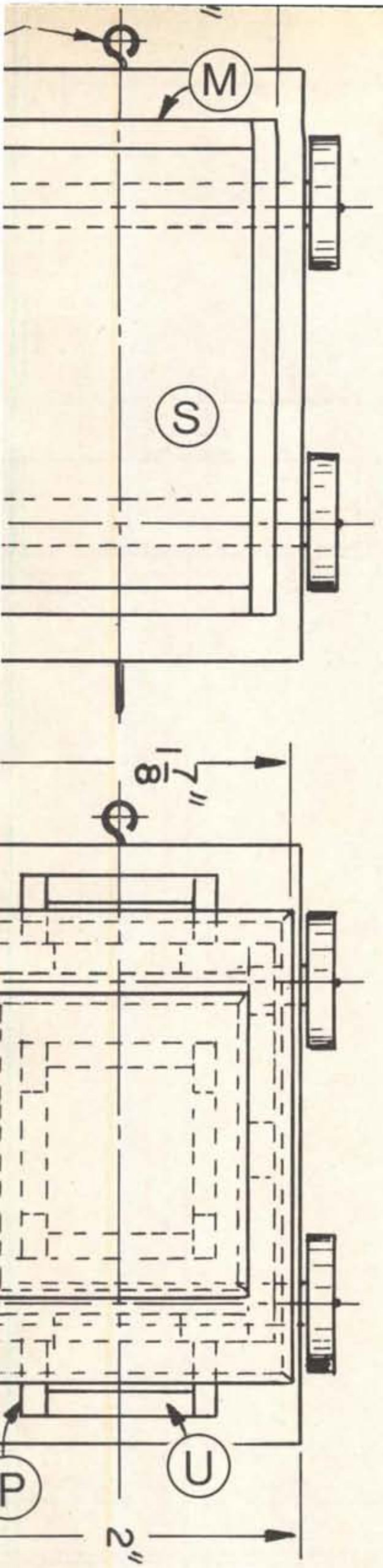
Supplies

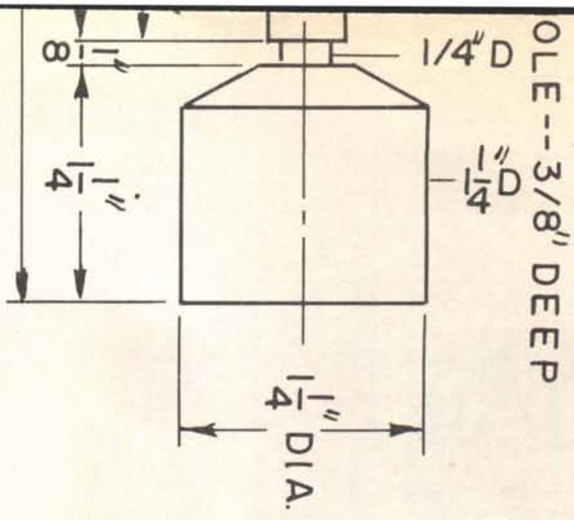
17	magnets (#430)
18	round head ring–shank nails (#410)
32	flat head ring–shank nails (#420)
2	self–locking posts and screws (#908)

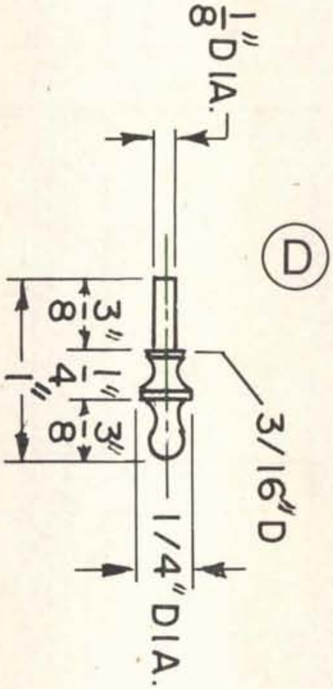
from: Cherry Tree Toys
P.O. Box 369
Belmont, OH 43718

*rough size









Toy Train

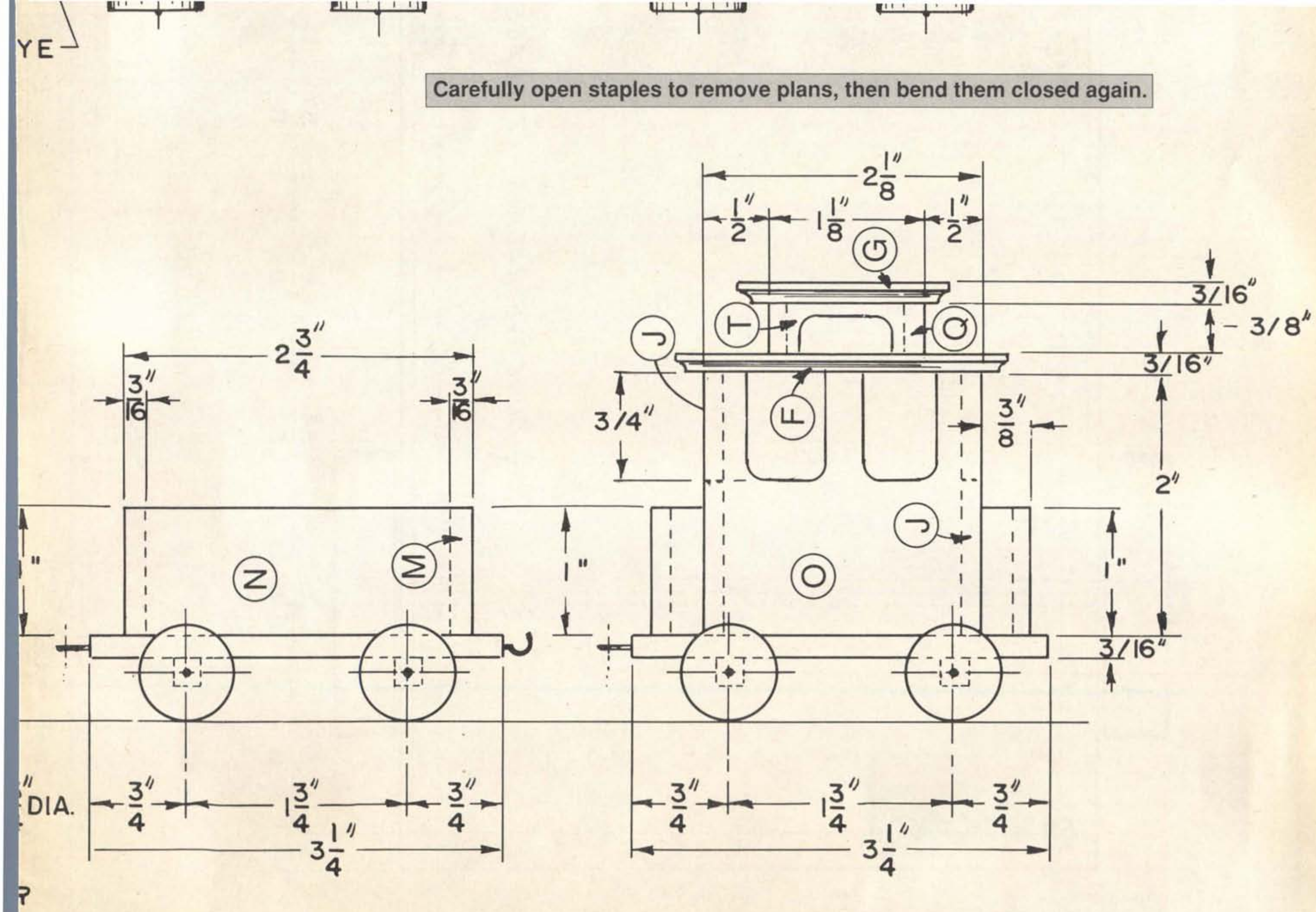
Cutting List

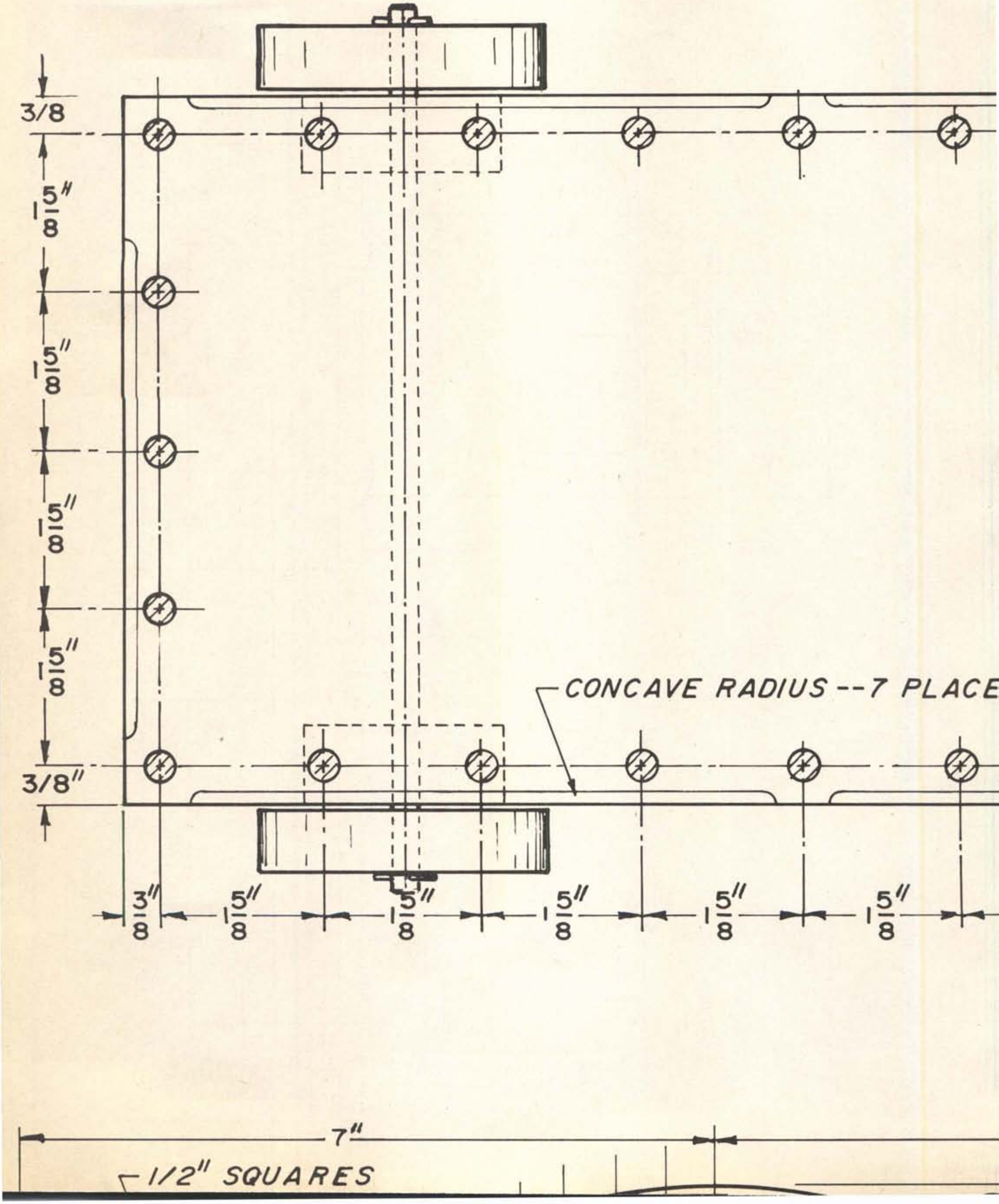
Qty	Part	Finished Size			Piece
		T	W	L	
16	A	3/16"	3/4" diameter		small wheels
2	B	3/16"	1 1/8" diameter		large wheels
1	C	1 1/4" diameter		9 5/8"	spindle
1	D	1/4" diameter		1"	whistle
1	E	3/16"	1 3/4"	1 7/8"	engine top
1	F	3/16"	1 7/8"	2 5/8"	caboose top
1	G	3/16"	1 3/8"	1 5/8"	cupola top
9	H	3/16"	3/16"	2"	axles
2	I	3/16"	1 1/4"	2"	engine sides
3	J	3/16"	1 1/4"	2"	tall ends
2	K	3/16"	1 1/2"	2 3/4"	tender sides
1	L	3/16"	1 1/2"	1 1/4"	tender front
3	M	3/16"	1"	1 1/4"	short ends
2	N	3/16"	1"	2 3/4"	short sides
2	O	3/16"	2 1/8"	2"	caboose sides
4	P	3/16"	1"	3/8"	railing sides
2	Q	3/16"	3/8"	5/8"	cupola ends
1	R	3/16"	2"	4 1/4"	large base
3	S	3/16"	2"	3 1/4"	small bases
2	T	3/16"	3/8"	1 3/16"	cupola sides
2	U	3/16"	3/4"	1"	railing ends

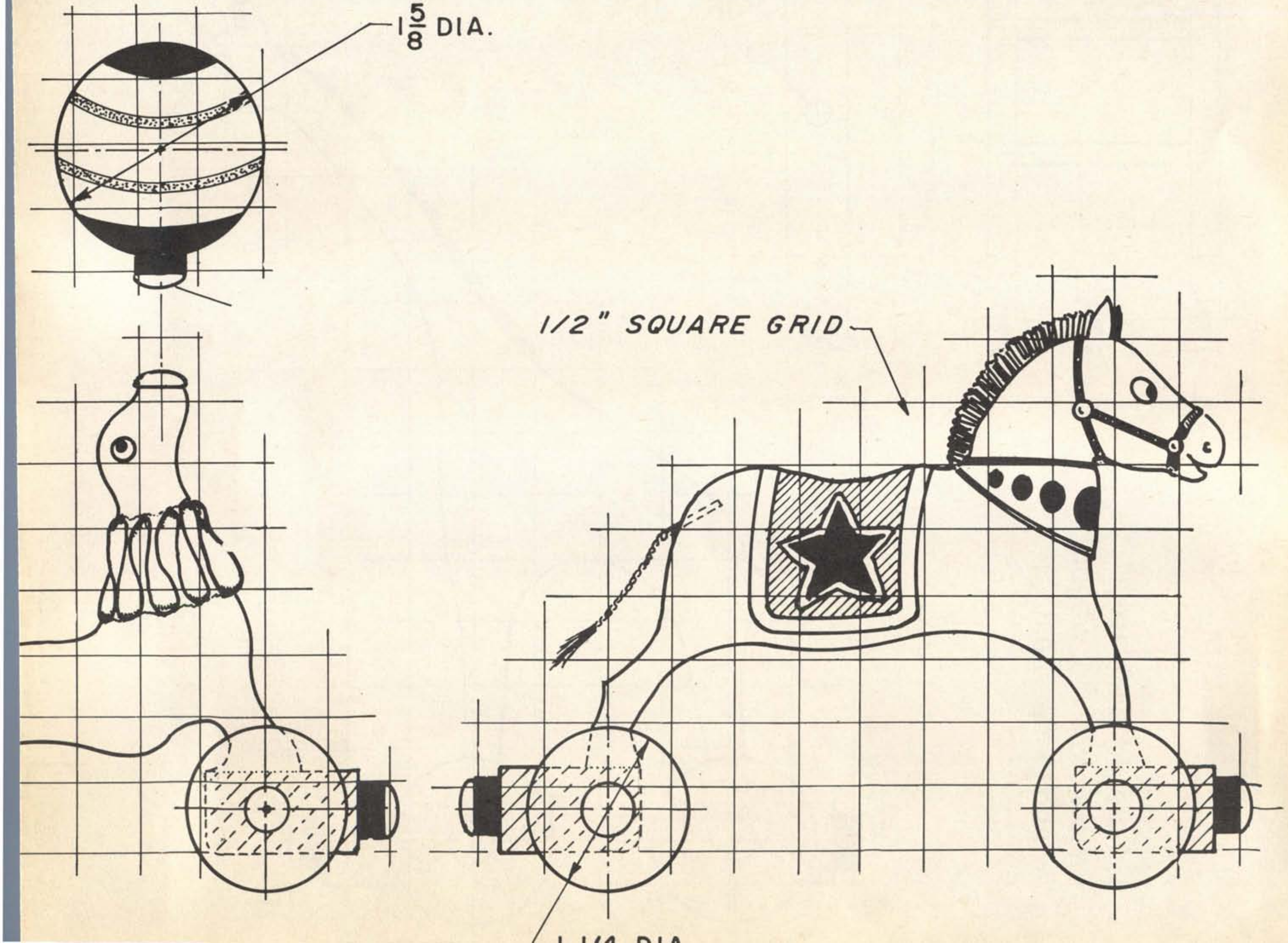
Supplies

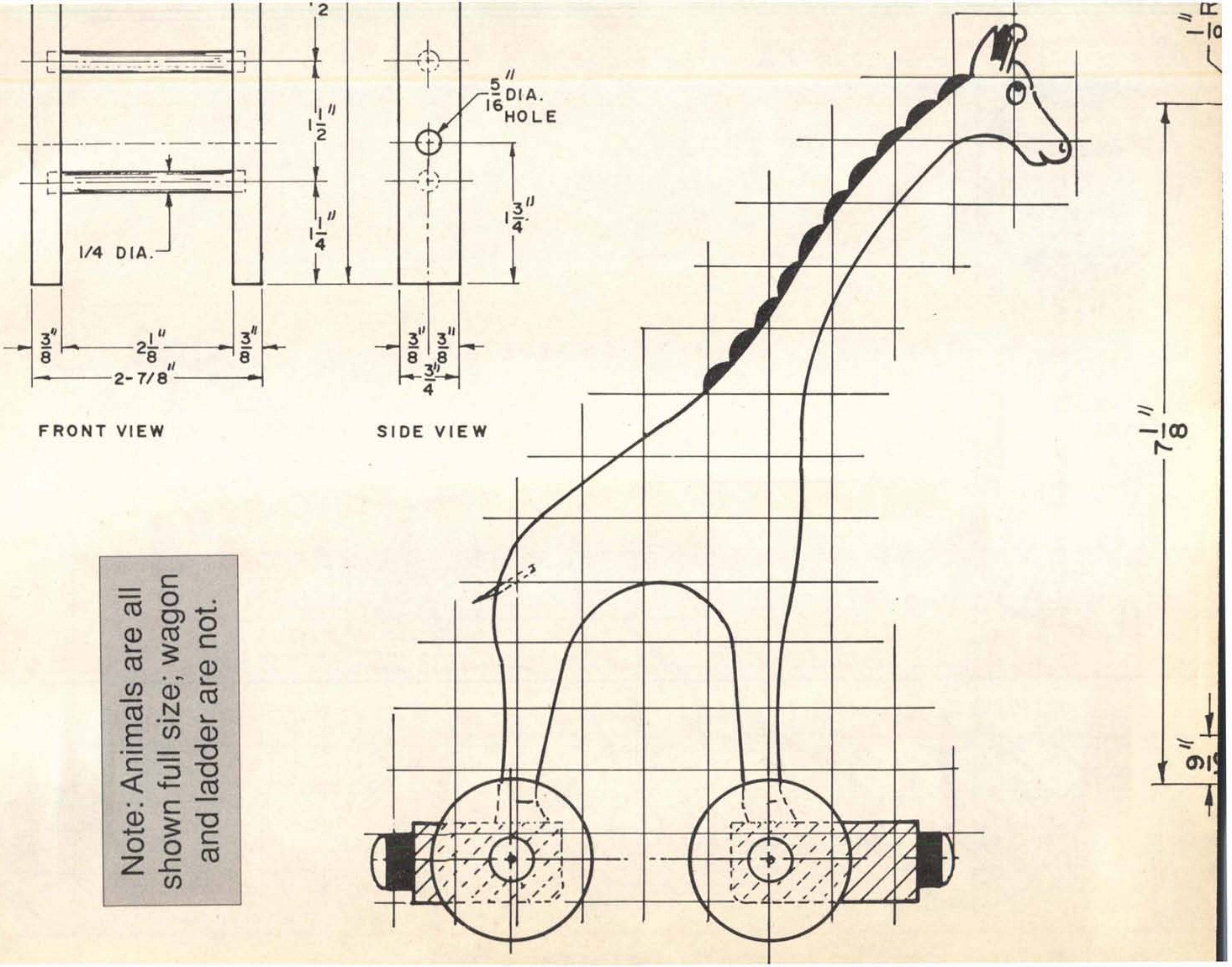
3	small eyes
3	small hooks
18	brass tacks

Carefully open staples to remove plans, then bend them closed again.

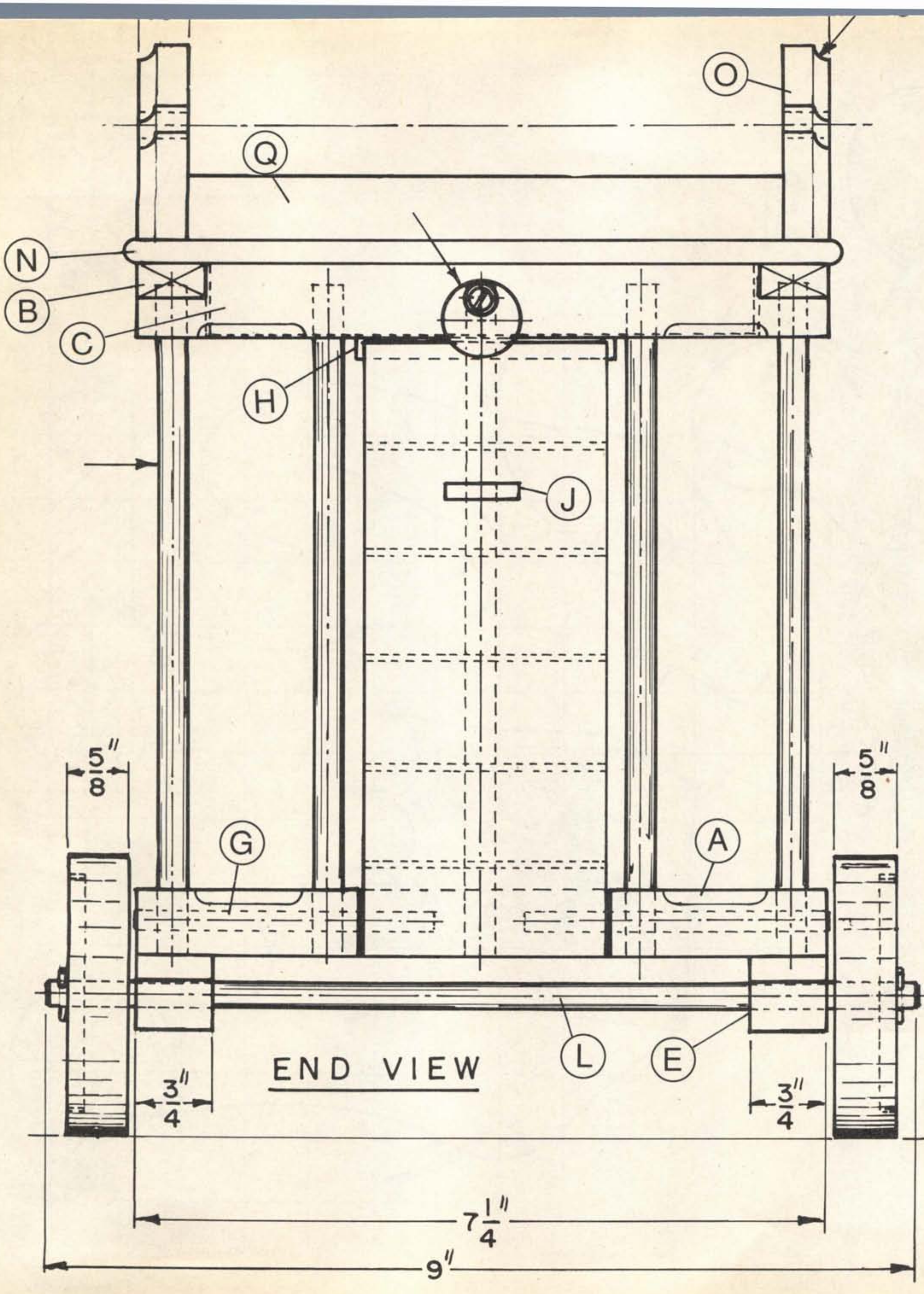


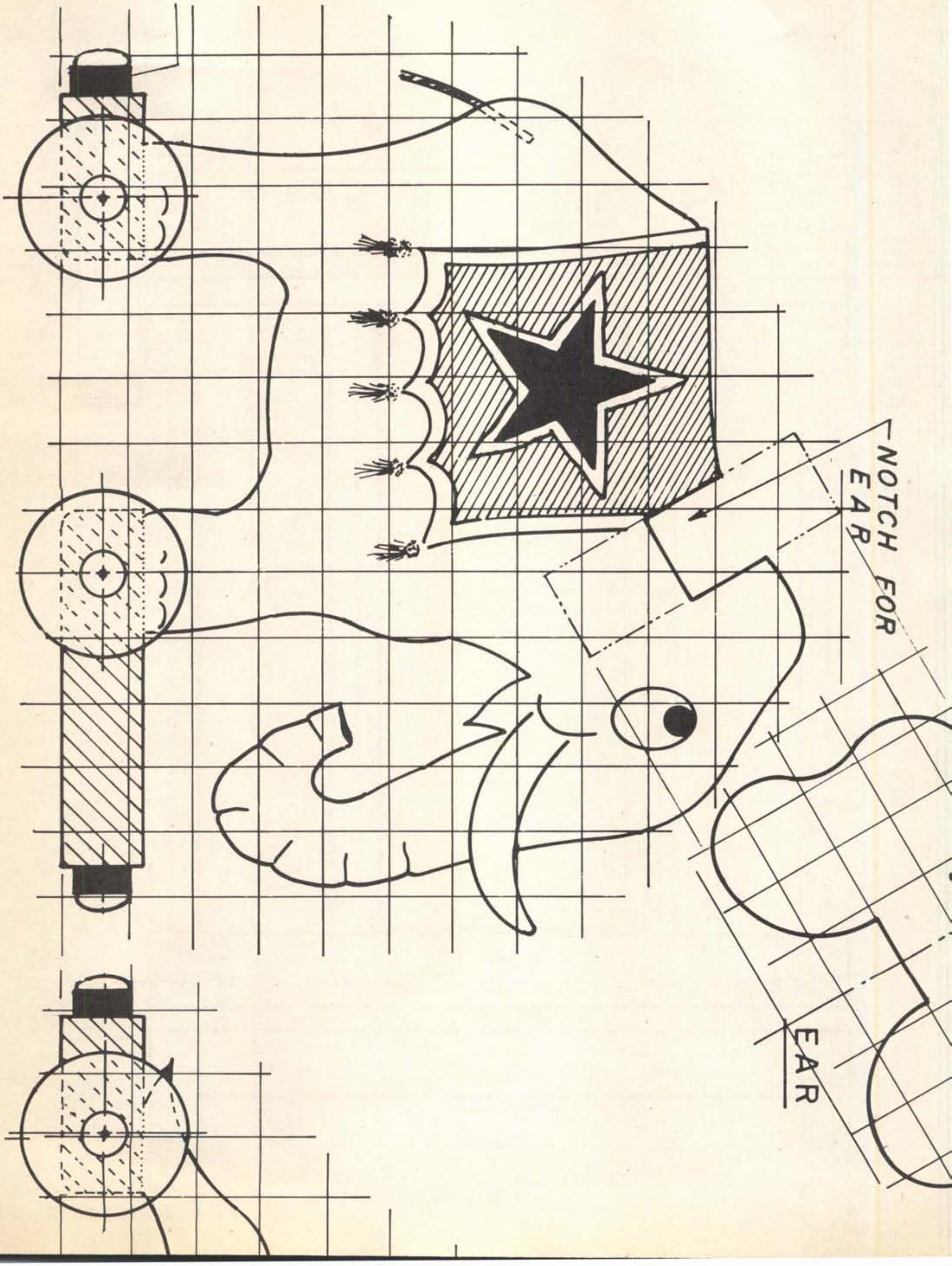

3/8
1 5/8"
1 5/8"
1 5/8"
1 5/8"
3/8"
CONCAVE RADIUS --7 PLACE
3/8"
1 5/8"
1 5/8"
1 5/8"
1 5/8"
1 5/8"
7"
1/2" SQUARES

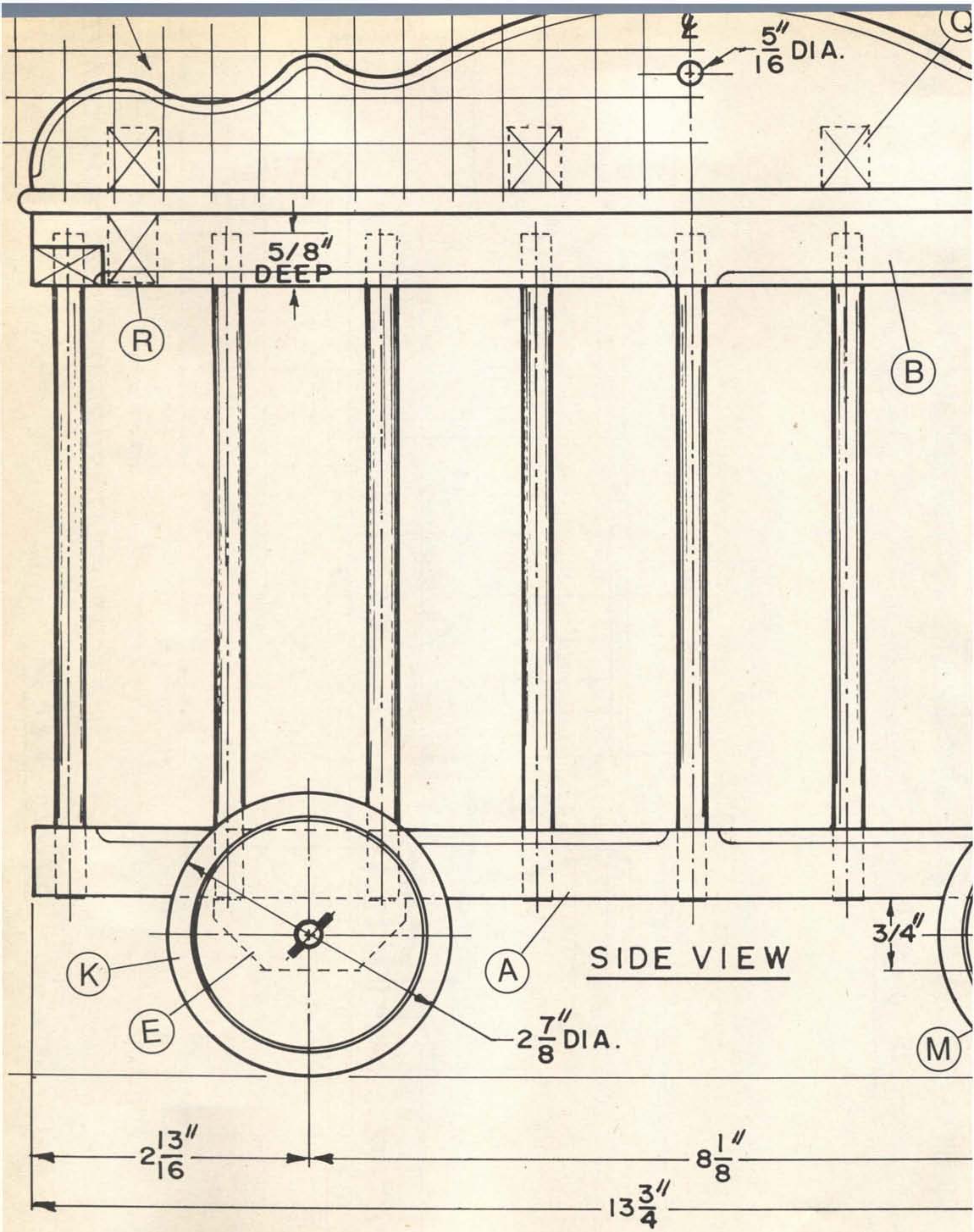

1 5/8 DIA.
1/2" SQUARE GRID
1 1/4 DIA.



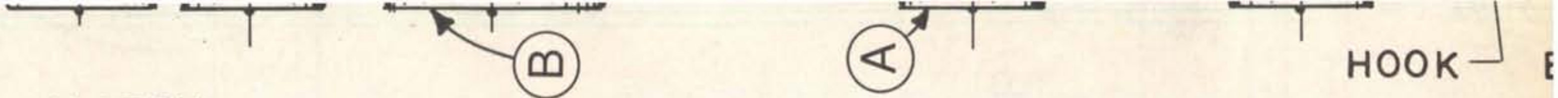
Note: Animals are all shown full size; wagon and ladder are not.


O
Q
N
B
C
H
J
5/8″
5/8″
G
A
L
E
END VIEW
3/4″
3/4″
7 1/4″
9″

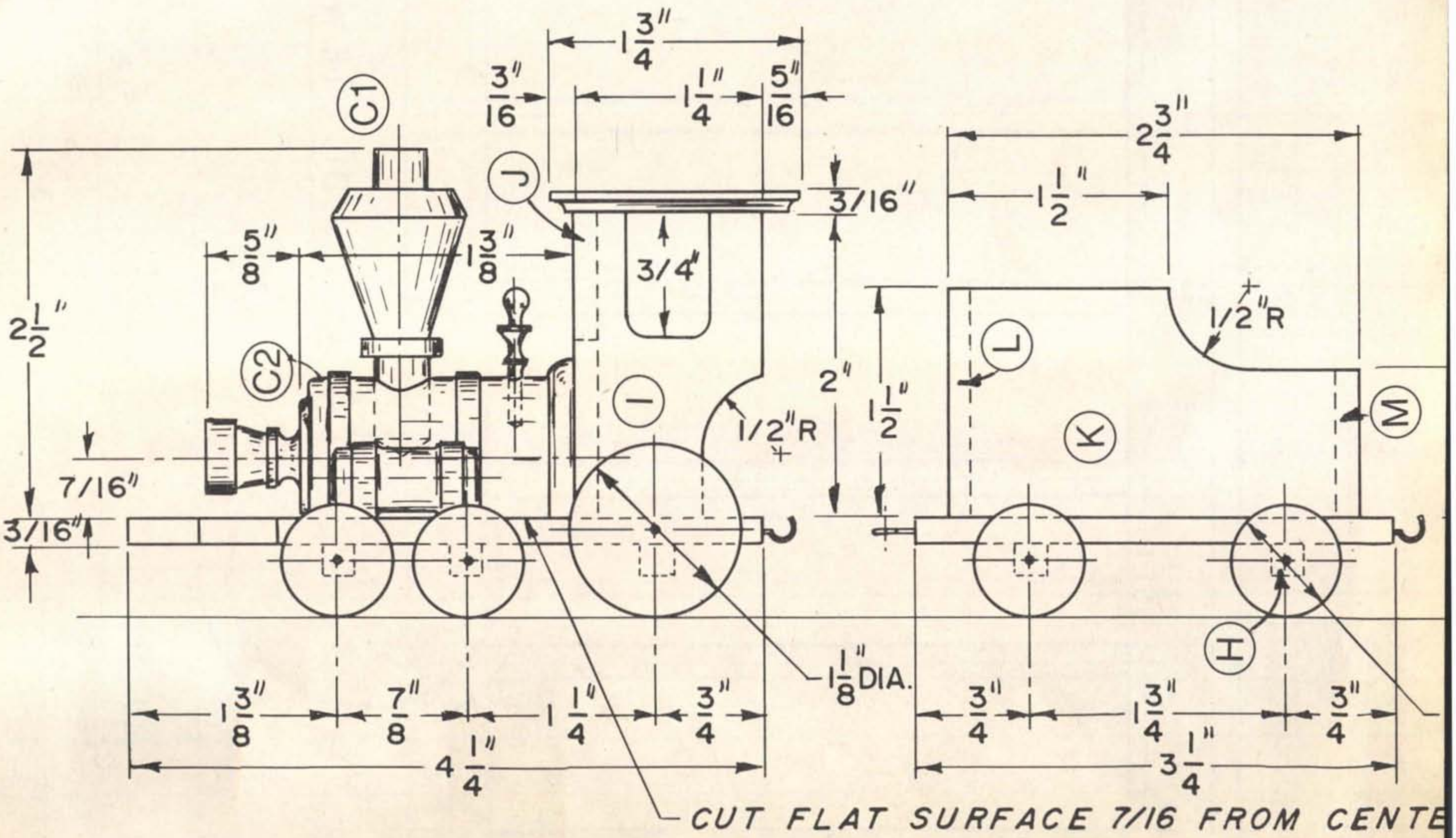

NOTCH FOR EAR
EAR



Q
℄
5/16" DIA.
5/8" DEEP
R
B
K
A
SIDE VIEW
3/4"
E
2 7/8" DIA.
M
2 13/16"
8 1/8"
13 3/4"



TOP VIEW



SIDE VIEW

Heartwood ranges in color from dark brown, grayish–brown, grayish–white, to a clear yellow–white—or combinations thereof. Sometimes approaching the hardness and density of oak, ash is at other times soft enough to dent with your fingernail. Without the prominent rays of oak, ash tends to be more delicate in appearance. Its pattern, however, is bolder and larger than that of oak. Its figure can be rippled or bubbled, but this is rare.

Working Properties

Ash is more easily worked than oak or hickory. It machines well, though it may burn if you don't keep the tools moving. The occasional figured areas can tear out during planing.

An excellent wood for turning, ash cuts fast and clean and takes a nice polish on the lathe. Chair spindles, which have to be flexible, are often turned of ash.

This springy material is also known for its bendability. Once softened by steam, straight–grained pieces can be given a severe bend without losing their strength. One snowshoe maker claims coarser–grained wood is better for bending than the finer–grained pieces. Thin, pliable layers of ash lend themselves to bent lamination work. Wooden tennis racket frames, for example, are composed of ash. Surface preparation is not necessary when gluing this wood, since it accepts all types of glue.

Be careful when sanding ash; the soft spring growth sands more quickly, so the wood may abrade unevenly.

Finishing

Along with oil and wax, lacquer or tung oil finishes, more unique finishing techniques are effective on ash.

The open pores can be filled with colored fillers in order to emphasize grain pattern. Seal the wood first with a light coat of lacquer, then rub filler or stain into the wood. The pores take the color, but the surrounding wood is not affected. Spray on additional coats of lacquer to seal in the color.

To whiten ash, treat it with one or more applications of two–part wood bleach. The powerful chemicals break down the fibers of the wood and soften the surface. That bleached surface is thin, so finish sanding should be done prior to applying the bleach. Water white lacquer preserves the finish, though even bleached ash yellows slightly over time. Some people wipe one of the numerous "whitewash" stains that are on the market over the bleached ash to further whiten the wood.

Sandblasting gives ash a worn, weathered look. Porous spring growth is eaten away, leaving the dense summer growth prominent.

Availability

Any of the native commercial species mentioned in this article are mixed together at the mills and sold as "white ash." Distinctions in lumber are made usually according to qualities, not species. Loosely translated, terms like "northern" or "tough" indicate ash that is slower grown, harder, and stronger. These trees do not grow as large. "Southern" or "soft" refers to faster grown ash that generally has better color and comes in larger sizes. "Brown" describes the color of ash lumber, but is not necessarily denoting the species black ash.

Ash lumber is widely sold in all thicknesses from 4/4 up to 16/4. Boards average 6" – 12" in width, and 16' in length. Presently the price of ash is equivalent to that of red oak. PW

The frames on these beavertail snowshoes from Maine are formed from a single strip of steam–bent white ash. The lacing is rawhide.

photo by the author

The Greatest Show on Earth

by John A. Nelson

Step right up and see the Greatest Show on Earth! Yes siree, it's circus time! Smell the popcorn, listen to the laughter, and look, here comes the parade! Seals and giraffes, camels and horses, hippos and elephants too—a spectacle of circus animals—lined up for all to see.

If you dare, look inside the brightly colored circus wagon as it rolls into view. There, behind bars, is the fierce and ferocious lion. Imagine the roar of delight as your child or grandchild enjoys their very own circus.

Overall, this project is rather easy to make but it does involve many simple steps. This circus will take longer to make and finish than it seems at first glance. There are many, many small details to do.

This project incorporates some supplies from Cherry Tree Toys. Ceramic magnets and round head ring–shank nails are used to join the animals together for parades, flat head ring–shank nails attach the wheels to the animals and special self–locking post and screws are used to safely attach the arms and legs to the clown. Specific ordering information is included in the cutting list on page 55; order them before you start so you'll have them when you're ready for them.

***John A. Nelson** is a woodworker and drafting instructor from Peterborough, New Hampshire, and the author of 21 books on various subjects, including* Colonial Classics You Can Build Today *(Stackpole Books, Cameron and Keller Streets, P.O. Box 1831, Harrisburg, PA 17109).*

Because this toy will be used by children, extreme care must be taken so no small part can come loose, and be sure to use lead–free paint at all times.

The trickiest piece to make in this project is the wagon. Cut the base (A) to size according to the cutting list, and make the 13/16" × 3-1/8" notch in the back end as shown in the PullOut™ plans in the center of this issue.

Cut the top supports (B and C) to size and notch the ends to make a tight overlapping corner joint. Glue them together to form a frame with outside edges that match the perimeter of the base (A). When this assembly is dry, clamp it to the base so you can drill the holes for the bars (D) in both pieces simultaneously. Locate the centers of these 5/16" diameter holes where indicated in the PullOut™ plan. Use a drill press to drill from the bottom of the base and into the top supports with the depth stop set so you don't come all the way through the supports. Then sand both pieces.

Using a rotary tool and a 1/8" radius cove bit with a guide bearing, rout the seven concave cuts shown in the base and the top support. This step is not necessary if you don't have the router bit, but it does add a nice detail, making the wagon look less bulky and more to scale.

Cut the bars (D) to length and sand a slight chamfer on the ends so they will fit into their holes easily. Glue the bars into the base and then apply the top support frame, maintaining an overall height of 7-1/4" all the way around this assembly.

Chamfer the ends of the axle supports (E), and drill a 3/8" hole through the center of each. Glue and nail them to the base as shown in the plans.

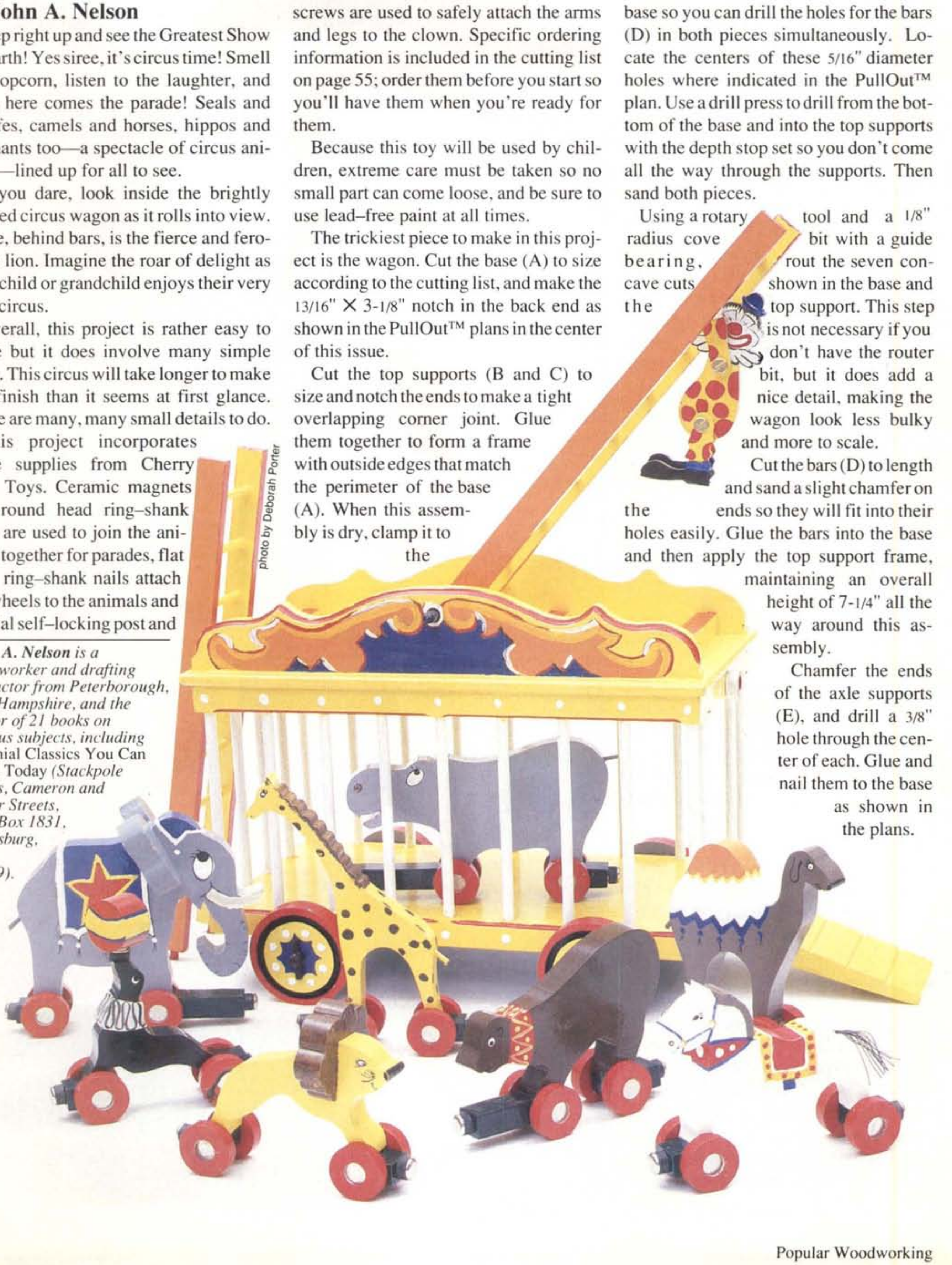


photo by Deborah Porter

Cut and shape the ramp (F) and make shallow saw kerfs in the top surface as shown. Carefully locate the 3/16" diameter holes for the hinge pins (G) on either side of the notch in the base. With the ramp in place, drill from the outside of the base to about an inch into the ramp itself. Do this from both sides, then temporarily fit over–long hinge pins (G) in place to make sure the ramp works properly. (If it doesn't, fill the holes in the ramp with dowels and try again.) When it all works properly, tap the hinges in with just a little glue on the last portion; you want them glued only to the base. Make sure the ramp works correctly before the glue sets.

Attach the ramp stop (H) to the underside of the top support piece (C) in such a way that the ramp closes flush to the outside of the support. Make the ramp lock (I) from a 1/4" length of 3/4" dowel and drill a counterbored hole located 3/16" up from the center to accept a short pan head screw and washer. Glue the ramp handle (J) to the ramp as shown in the plan.

Cut the wheels (K) from 5/8" thick stock using an adjustable fly cutter. First set the cutter to a diameter of 2-1/8" to score a shallow kerf indicating a tire. Then set it to the 2-7/8" outside diameter to cut out the wheel.

Slide the axles (L) into the axle supports (E) which are already attached to the base, and then slide the wheels on. Allow about 1/32" clearance between the wheels and the base, and locate the 1/8" diameter holes for the pins (M) that hold the wheels on.

Cut the top (N) to size and round the edges. Then cut the top trim pieces (O) to the rough size shown in the cutting list. Tape or tack these two trim pieces together, layout their shape from the pull out plan, and cut and sand them as a pair. While they're still together, drill the 5/16" diameter hole for the ladder support pin (P) through the two pieces. Round the ends of the support pin and sand it all over so that it slides through these holes easily.

Use the same small router bit you used for detailing the base to detail the top edges of the trim (O), stopping short of the ends. Attach the trim and the two trim supports (Q) that go nearest the ends to the top (N). You'll position the other two trim support pieces later. Glue the two aligning boards (R) to the underside of the top in such a way that they fit loosely down inside the top support frame and center the top over the wagon.

Make the four ladder posts (S) and

The Greatest Show on Earth

Cutting List

		Finished Size			
Qty	Part	T	W	L	Piece
1	A	3/4"	7 1/4"	13 3/4"	base
2	B	3/4"	3/4"	13 3/4"	long top supports
2	C	3/4"	3/4"	7 1/4"	short top supports
23	D	5/16" diameter		7 1/8"	bars
4	E	3/4"	3/4"	2 1/4"	axle supports
1	F	3/4"	3 1/16"	5 3/4"	ramp
2	G	3/16" diameter		3"	hinge pins
1	H	1/4"	1/4"	3 1/4"	ramp stop
1	I	3/4" diameter		1/4"	ramp lock
1	J	1/4"	1/4"	1"	ramp handle
4	K	5/8"	2 7/8" diameter		wagon wheels
2	L	3/8" diameter		9"	axles
4	M	1/8" diameter		3/4"	cotter pins
1	N	5/16"	7 1/2"	14"	top
2	O	9/16"	*2 1/8"	*13 3/4"	top trim pieces
1	P	5/16" diameter		8"	ladder support pin
4	Q	3/4"	5/8"	6"	trim supports
2	R	3/4"	5/8"	5 3/4"	aligning boards
4	S	3/4"	3/8"	14 1/2"	ladder posts
18	T	1/4" diameter		2 1/2"	rungs
32	U	1 1/4" diameter		5/16"	animal wheels

Supplies

17	magnets (#430)
18	round head ring–shank nails (#410)
32	flat head ring–shank nails (#420)
2	self–locking posts and screws (#908)

from: Cherry Tree Toys
P.O. Box 369
Belmont, OH 43718

*rough size

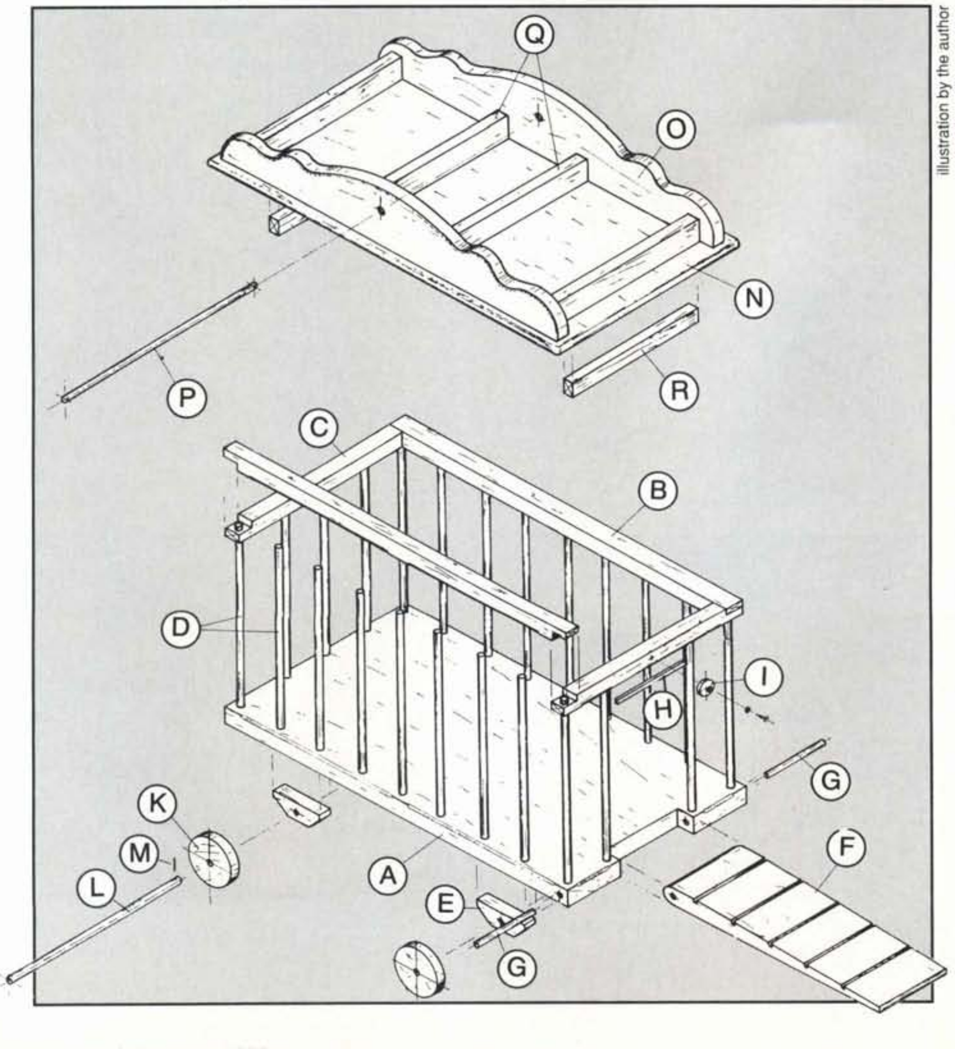


illustration by the author

drill 1/4" holes halfway through their thickness for the rungs (T). Then drill a 5/16" diameter hole all the way through as shown in the plan. This hole is for the ladder support pin (P) to lock the ladder in place on top of the wagon.

When the ladder is assembled, hold it in place on the wagon top and slide the pin through this assembly. Now position the two leftover trim supports (Q) so that they catch the bottom of the ladder and allow it to lean at about a 60° angle, then glue them in place.

This completes the wagon assemblies. Remove the ladder and its support pin, the wheels and axles, and the ramp lock so you can sand and paint everything.

Now it's time to make the animals. Transfer the patterns from the PullOut™ plan to a piece of 3/4" thick hardwood. Try to arrange the patterns so as to position the grain of the wood in the strongest direction so the animals will not break – for example, along the giraffe's neck. Each animal and the base it rides on should be cut as one piece.

Make the clown's body from 1/2" thick material, and his arms and legs from 1/4" stock. Drill 3/16" diameter holes for the self–locking posts and screws and 5/16" holes in the hands for grabbing the ladder rungs.

Cut the wheels (U) from a length of 1-1/4" dowel. Each wheel needs to have a 3/8" diameter counterbore drilled in its center to accept the head of the nail that attaches it to the animal. To do this, clamp a piece of scrap wood to your drill press table, and bore through it with a 1-1/4" Forstner bit. Without removing the scrap wood, replace the 1-1/4" bit with a 3/8" Forstner bit. Adjust the depth stop so that it drills 1/8" deep, and drill the counterbores with the wheels sitting in the hole in the scrap.

Sand the animals and the clown thoroughly, keeping the edges fairly sharp. Glue the elephant's ears and the lion's mane in place. Use wood putty where needed, and apply a lead–free primer. Sand lightly, reprime to obtain a smooth base for the paint, and lightly resand. Wipe all parts with a tack rag to remove the dust.

Paint your animals with bright colorful paints. Use your imagination; this is the fun part. You might want to get a book or two from the library to see how a real circus is painted. Add appropriate tails; they can be made of twine or dowels or whatever you can think of; just make sure they're glued in well.

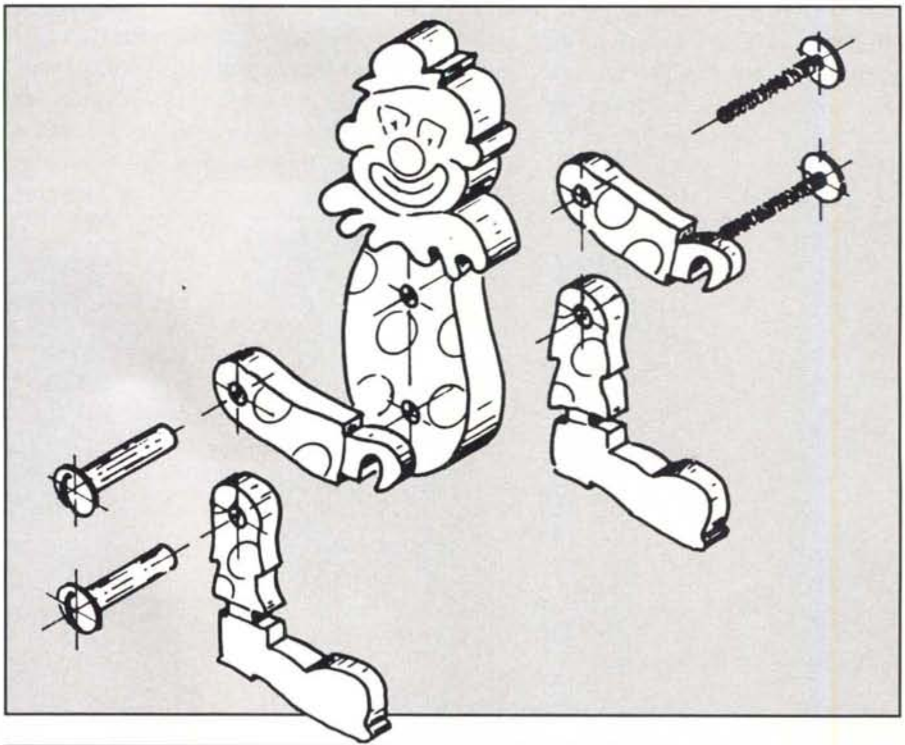
After the animals are painted, attach the magnets with the round head ring–shank nails. Note that one end of the magnets are positively charged and the other ends negatively charged. Be sure to attach them so the pluses are at the front of the animals and the minuses are at the backs. This is important if you want all the animals in the parade to face the same direction. Put a round head nail on the seal's nose and a magnet on the ball so that they attract each other.

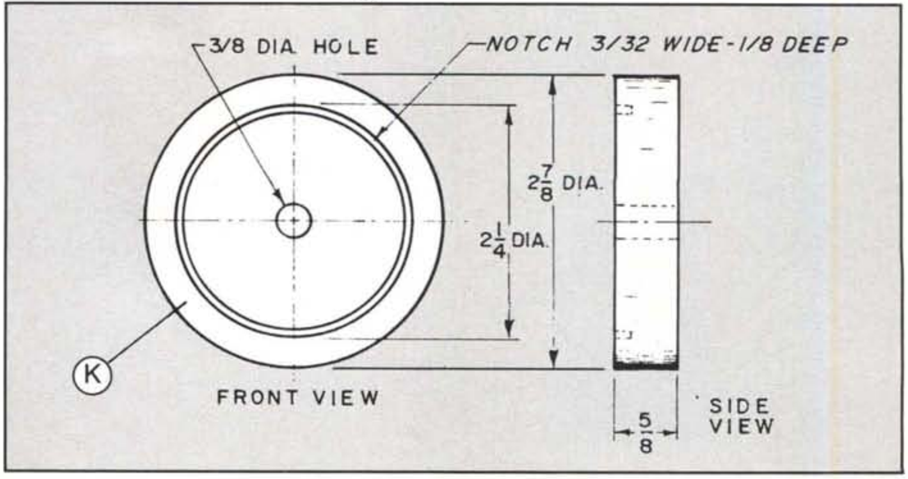
Paint the animal wheels bright red, and rub a little soap in the counterbores so they will rotate smoothly. Nail the wheels to the animals using the flat head ring–shank nails. Don't use standard nails as they might come loose.

After decorating the wagon wheels, attach them to the wagon. Glue the cotter pins (M) into the axles (L).

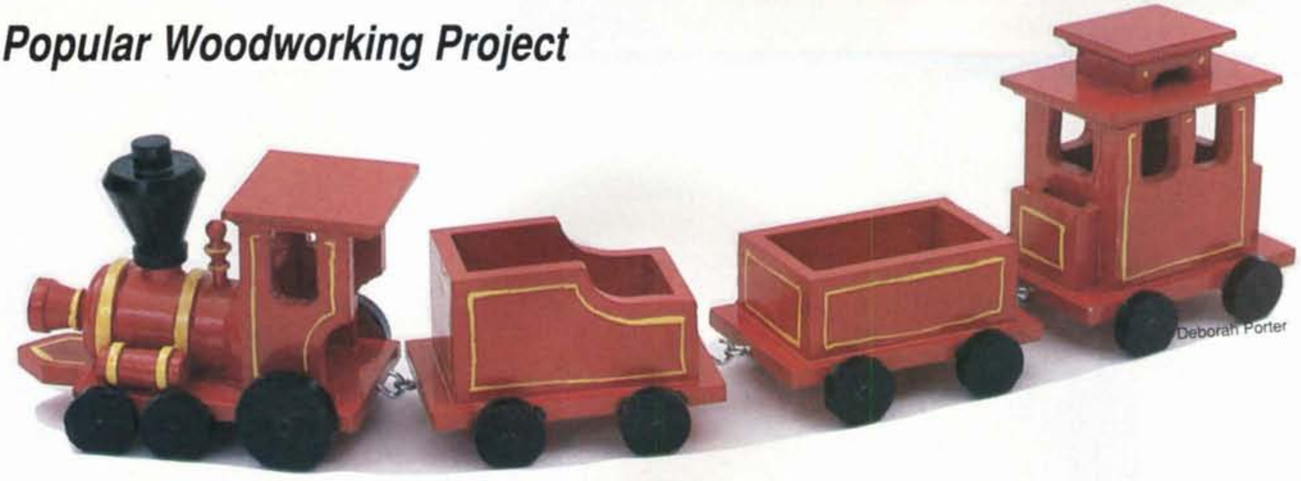
Attach the clown's arms and legs using the self–locking post and screws. Use a thin flat washer between the limbs and the body if necessary to have a snug fit. Fit the arms and legs so they move somewhat stiffly. Be sure the self–locking post and screws are very tight so there is no chance they can come apart. You might want to use epoxy in the threads so there is no way they can ever come apart again.

Apply a light coat of paste wax to the wagon, ladder, animals and clown, and then let the action begin, but try not to wear out the circus before giving it to the kids. **PW**





A Popular Woodworking Project


Deborah Porter

A Toy Train

by John A. Nelson

Trains have been a favorite as toys throughout the years, especially the old steam trains, with their rustic shapes and features. This train requires very little wood to build and can be made from your scrap pieces. The train can be cut out and assembled easily in a weekend, not counting the painting which may take another day or so. Lacquer or fast–drying paint will make this part go more quickly.

The toy train shown here is intended as a decoration so the wheels are secured in place. You can make this project as a working toy by building it so the wheels turn, simply by drilling the wheel holes a little larger and not gluing them in place. You should be careful, though, if you plan to give this toy to a small child, that the wheels can't come loose easily, and that all small parts that could be swallowed are fastened securely. Lead–free paint should also be used (this is always a good idea in any case, but especially important on toys for small children who like to nibble).

Cutting the Parts

To begin, select a straight–grained knot–free piece of hardwood that's 2' long × 6" wide, and plane or scrape it down to a thickness of 3/16". Sand both sides smooth, and joint one edge on one side and cut the board to just over 5-1/2" wide and 21" long. Carefully lay out all parts as illustrated on the following page. Leave a 3/16" space between the parts to allow for a standard saw blade width. If your blade is wider, adjust the layout accordingly.

Locate and drill all the 1/4" diameter holes as shown. These will make the corners easier to cut, and will make all corners exactly the same size. Saw the board in two at the point marked "1st Cut," then make the three rip cuts where marked (2nd Cut, etc.).

Carefully cut each part out slightly larger than the layout lines, and then sand them to exact size. Label all the parts at this stage; this will be a big help as you proceed. Cut the small wheels (A) from a 3/4" diameter, 6" long dowel, and the large wheels (B) from a 1–1/8" diameter, 4" long dowel. Use a stop–gauge on your saw for this step to ensure that all your cuts are the same width (see "Jig Journal" below). Locate and drill a 3/64" diameter hole in the center of each wheel for the brass tack or brad.

Next, on the lathe, turn the spindle (C) which will form the turned parts as shown in the PullOut™ plan in the center of this issue. Start with either a 1-1/4" dowel or a 1-1/2" square piece, and cut the spindle to shape. After turning, sand the spindle and

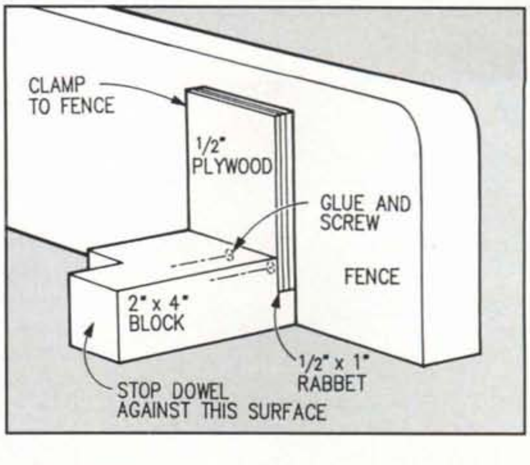
Jig Journal

Extended Stop Block

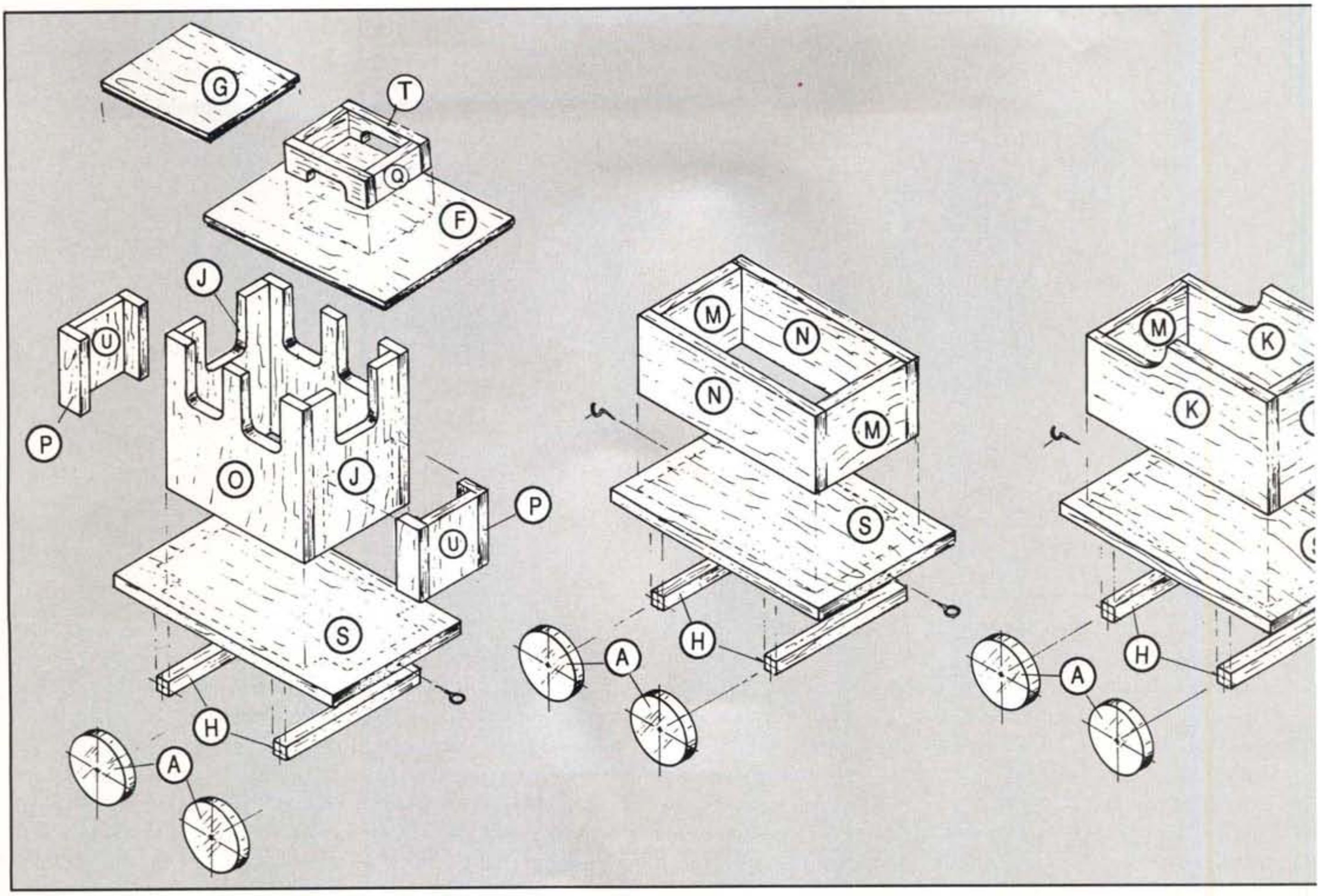
by David M. Camp

When cutting those thin rolling slices from a dowel to make wheels, use this simple extended stop block. It permits the fence to be set further from the blade than does a regular stop block, so the cut–off pieces can fall over freely.

***David M. Camp** is the editor of* PW.



***John A. Nelson** is a woodworker and drafting instructor from Peterborough, New Hampshire, and the author of 21 books on various subjects, including* Colonial Classics You Can Build Today *(Stackpole Books, Cameron and Keller Streets, P.O. Box 1831, Harrisburg, PA 17109).*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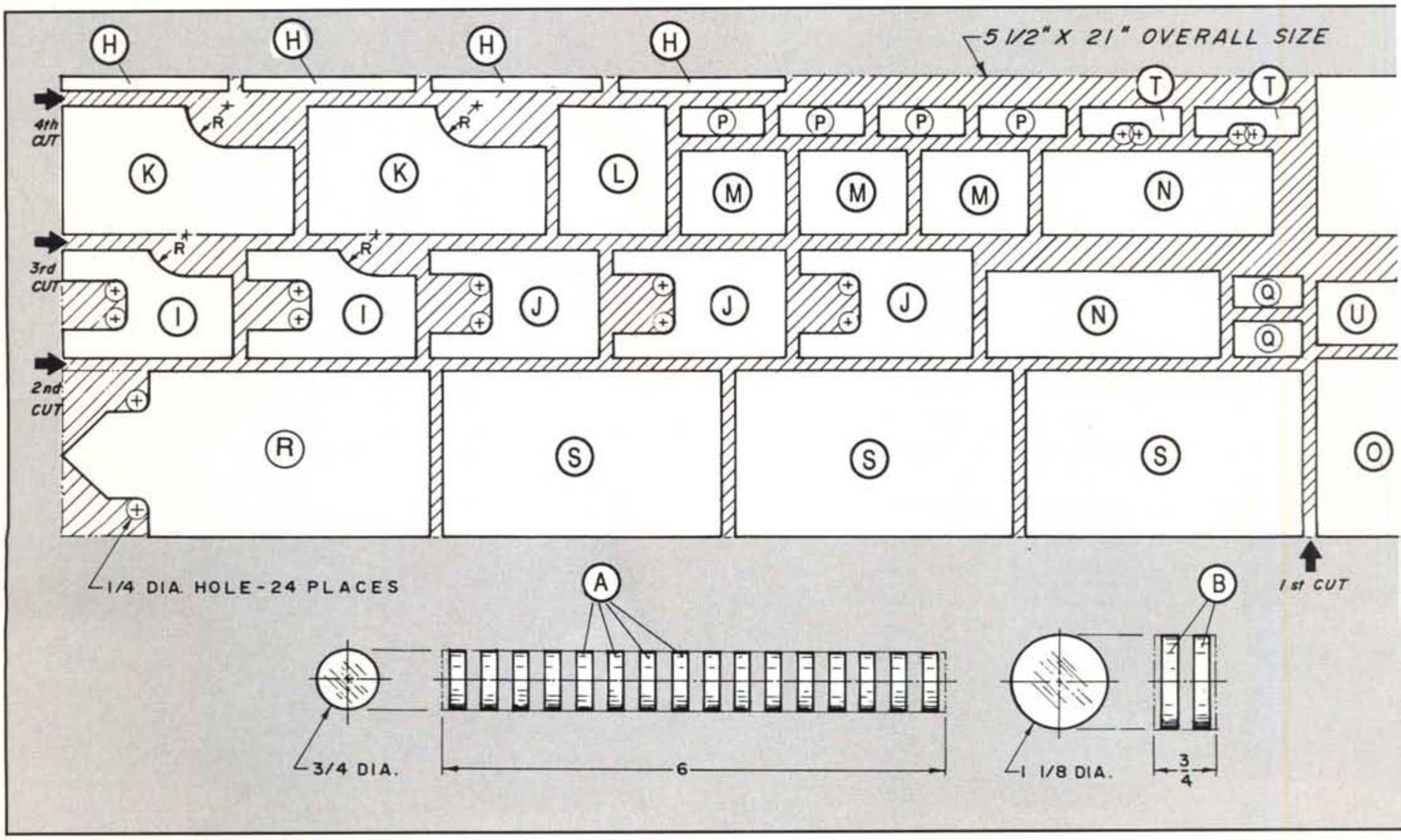
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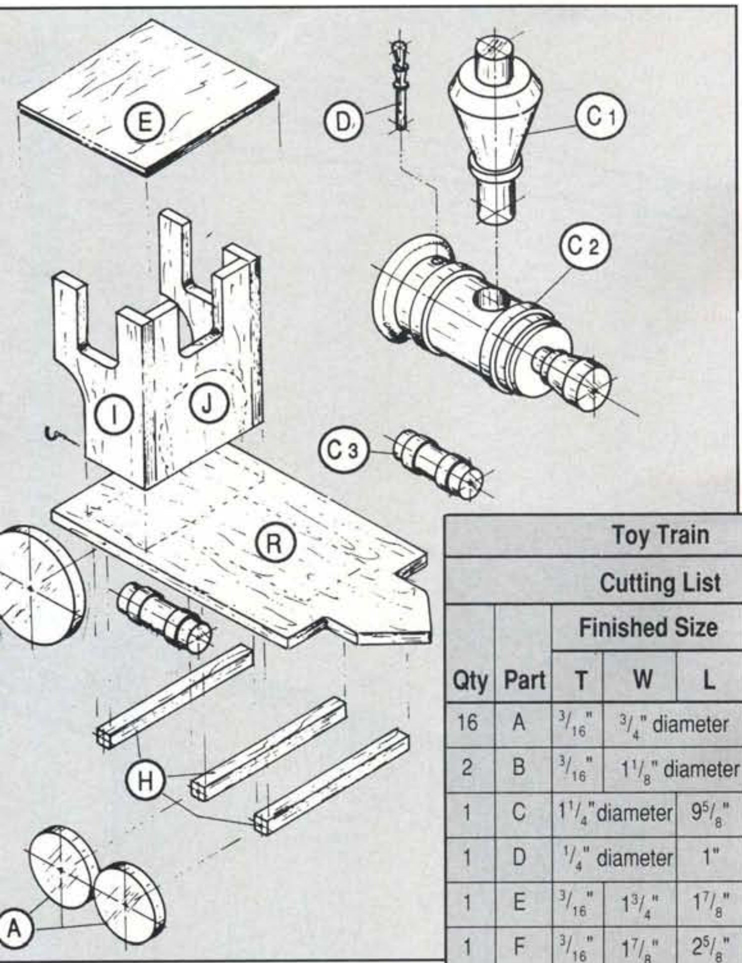
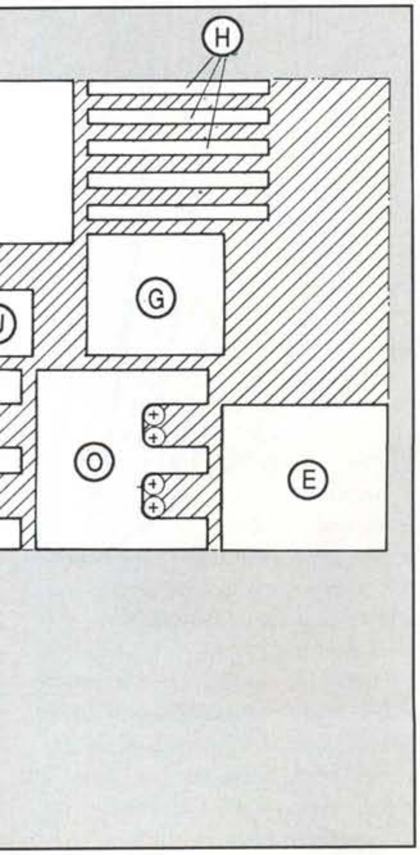


illustrations by the author



separate the parts (C1, C2, C3). Using a V–block to hold the turned pieces, locate and drill the 3/8" diameter and the 1/8" diameter holes in the boiler (C2), being sure these are in line with each other. Cut or sand the flat spot directly under the two holes in the boiler. Using a 1/4" dowel, turn the whistle (D) on the lathe to the measurements shown in the PullOut™ plan.

Using a rotary tool and a cove bit, make a small radius undercut in the three tops (E, F, G) as shown in the plan. (You may not have a cove bit this small; if not, cut a chamfer instead.)

Locate and drill 3/64" diameter holes in the center of the axles (H). Now you're ready to assemble the train.

Assembly

Before gluing, dry fit all parts to check for fit. Then carefully glue the parts together in the following order, keeping all parts as square as possible. For clamping small items such as these, rubber bands come in handy. Wrap the parts tightly with sturdy rubber bands and allow them to dry.

Toy Train

Cutting List

		Finished Size			
Qty	**Part**	**T**	**W**	**L**	**Piece**
16	A	3/16"	3/4" diameter		small wheels
2	B	3/16"	1 1/8" diameter		large wheels
1	C	1 1/4" diameter		9 5/8"	spindle
1	D	1/4" diameter		1"	whistle
1	E	3/16"	1 3/4"	1 7/8"	engine top
1	F	3/16"	1 7/8"	2 5/8"	caboose top
1	G	3/16"	1 3/8"	1 5/8"	cupola top
9	H	3/16"	3/16"	2"	axles
2	I	3/16"	1 1/4"	2"	engine sides
3	J	3/16"	1 1/4"	2"	tall ends
2	K	3/16"	1 1/2"	2 3/4"	tender sides
1	L	3/16"	1 1/2"	1 1/4"	tender front
3	M	3/16"	1"	1 1/4"	short ends
2	N	3/16"	1"	2 3/4"	short sides
2	O	3/16"	2 1/8"	2"	caboose sides
4	P	3/16"	1"	3/8"	railing sides
2	Q	3/16"	3/8"	5/8"	cupola ends
1	R	3/16"	2"	4 1/4"	large base
3	S	3/16"	2"	3 1/4"	small bases
2	T	3/16"	3/8"	1 3/16"	cupola sides
2	U	3/16"	3/4"	1"	railing ends

Supplies

3	small eyes
3	small hooks
18	brass tacks

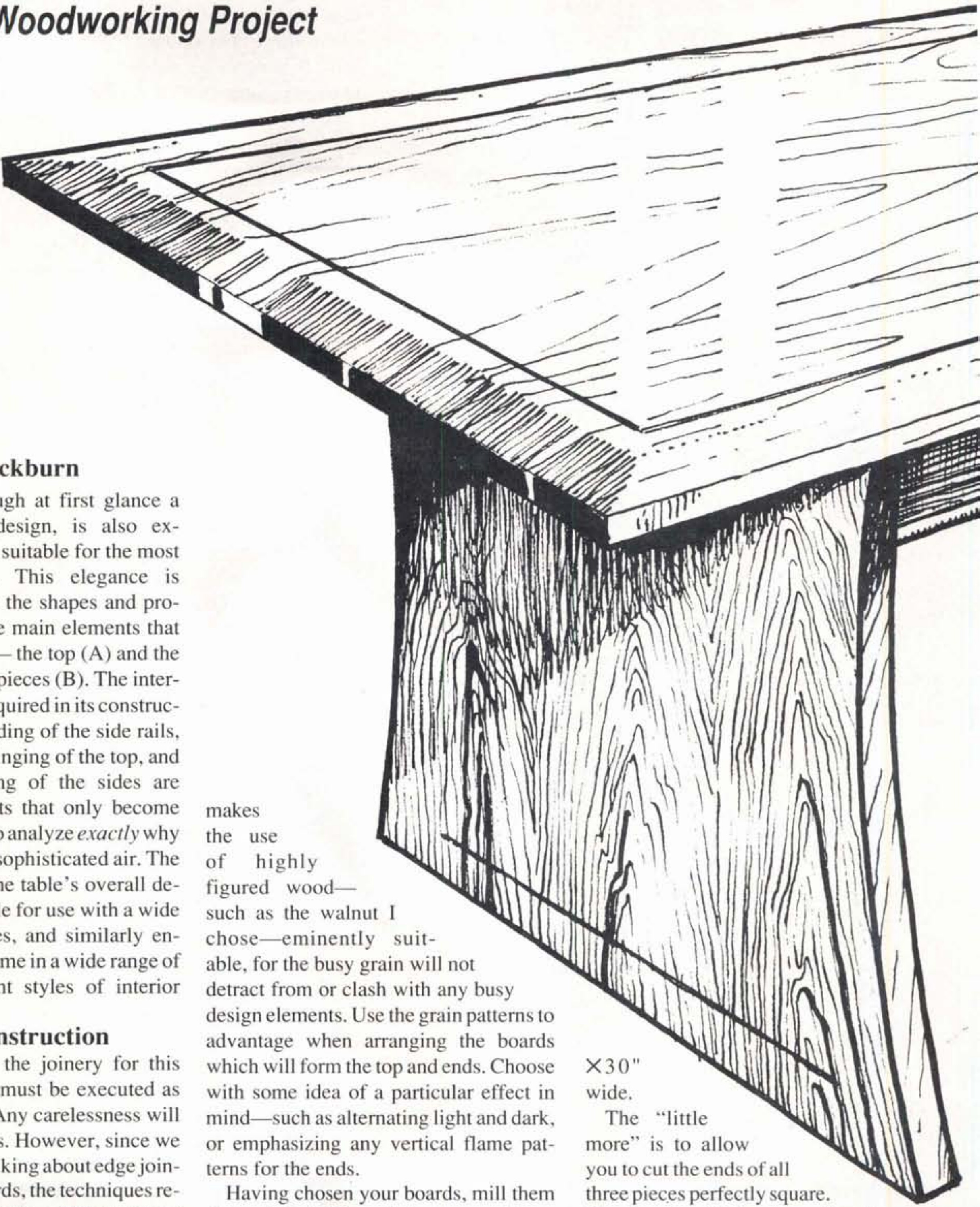
1. Glue the engine sides (I) to the engine front end (J).
2. Glue the tender sides (K) to the front (L) and end (M).
3. Glue the boxcar sides (N) to its ends (M).
4. Glue the caboose sides (O) to its ends (J).
5. Glue the caboose railing sides (P) to the railing ends (U).
6. Glue the axles (H) to the large base (R) and the small bases (S).
7. Glue the smokestack (C1) and the whistle (D) to the boiler (C2).
8. Glue the tanks (C3) to the engine assembly (I, J).
9. Glue the engine assembly to the large base (R).
10. Add the engine top (E) to the engine assembly.
11. Glue the tender sub–assembly (K, L, M) to a small base (S).
12. Glue the boxcar assembly (M, N) to a small base (S).
13. Glue the caboose sub–assembly (J, O) to a small base (S).
14. Glue the caboose top (F) to its sides (O), and glue the cupola top (G) to its ends (Q) and sides (T).
15. Glue the caboose railing sub–assembly (U, P) to the caboose (J, O).

Add the wheels, and your train is complete!

Finishing

Let your imagination take over at this point—be as creative as you like. I painted my train a bright candy–apple red with yellow striping and black wheels. Use a high–gloss paint that dries in a reasonable time. I am not an expert at pin striping, as you can see, but it doesn't have to be perfect and it is fun to do. You might try practicing on a scrap piece of wood first to get the feel of it before painting the train. After it's dry, let it decorate the room of your favorite little engineer. PW

A Popular Woodworking Project



by Graham Blackburn

This table, although at first glance a relatively simple design, is also extremely elegant and suitable for the most luxurious settings. This elegance is achieved largely by the shapes and proportions of the three main elements that comprise the table — the top (A) and the two end supporting pieces (B). The interesting techniques required in its construction such as the beading of the side rails, the beveling and stringing of the top, and the compass planing of the sides are understated elements that only become apparent as you try to analyze *exactly* why the table has such a sophisticated air. The very simplicity of the table's overall design makes it suitable for use with a wide range of chair styles, and similarly enables it to seem at home in a wide range of decors and different styles of interior decoration.

Basic Construction

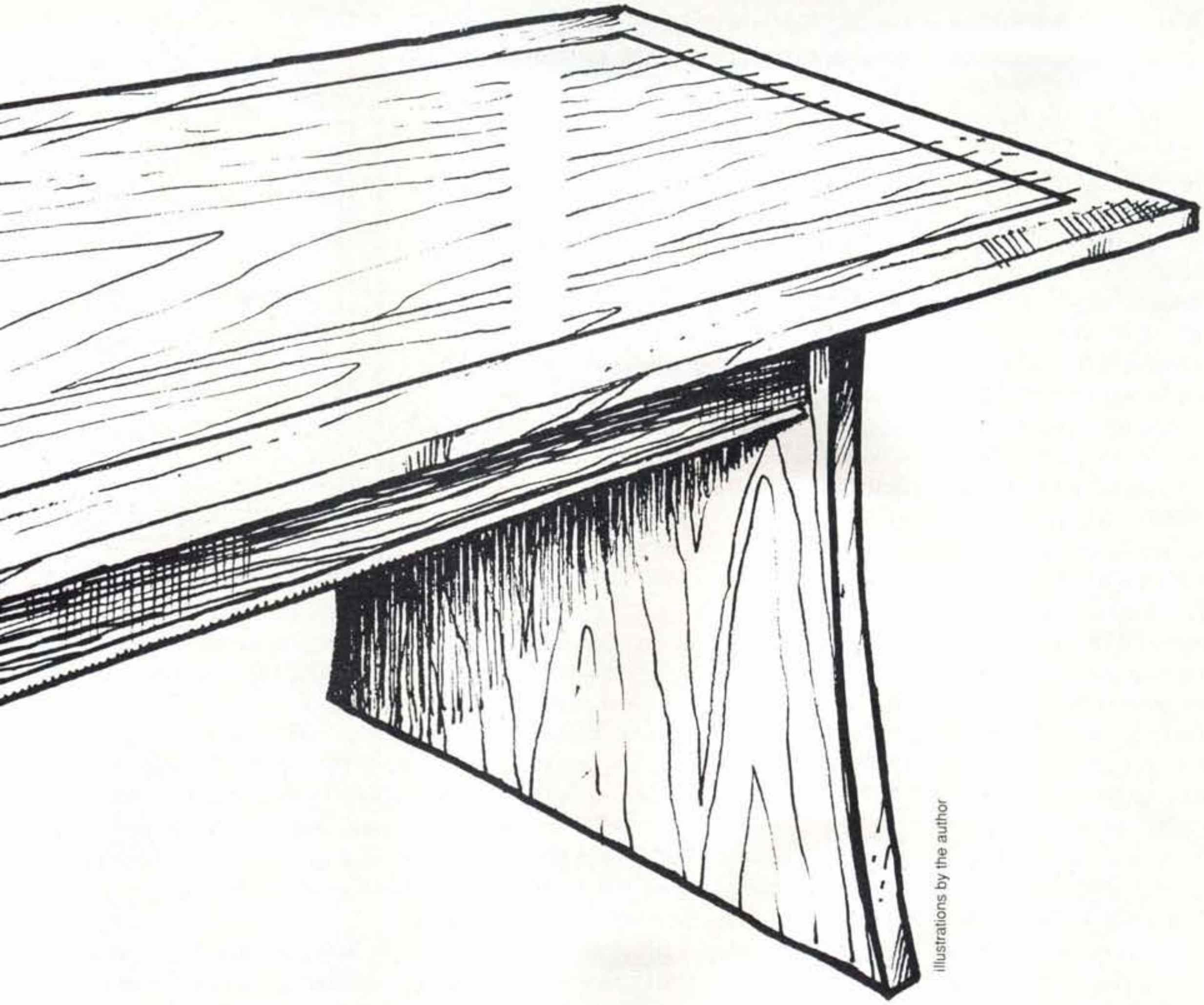
Since almost all the joinery for this table is exposed, it must be executed as neatly as possible. Any carelessness will be glaringly obvious. However, since we are basically only talking about edge join*ing* a number of boards, the techniques required should be easily within reach of most woodworkers. More important and more interesting is *what* boards you are joining. The basic simplicity of the design makes the use of highly figured wood—such as the walnut I chose—eminently suitable, for the busy grain will not detract from or clash with any busy design elements. Use the grain patterns to advantage when arranging the boards which will form the top and ends. Choose with some idea of a particular effect in mind—such as alternating light and dark, or emphasizing any vertical flame patterns for the ends.

Having chosen your boards, mill them flat and straight, and join them with the method of your choice. This can be by using simple rubbed glue joints, using dowels, splines, or even biscuits and a plate joiner. Whatever your method, you should end up with three large slabs: the top, measuring a little more than 6'– 6" long × 36" wide, and two ends, each measuring a little more than 28" high ×30" wide.

The "little more" is to allow you to cut the ends of all three pieces perfectly square. My shop is a little cramped so I find it easiest to cut the ends with a circular saw running against a fence clamped to the work—which I rest on saw horses. A precaution worth taking when using a circular saw like this is to apply a strip of masking tape to the top surface of the cut to help prevent any splintering.

The next step is to plane or surface the

***Graham Blackburn** is a furniture designer/ maker in Soquel, California and the author of many books on woodworking and home maintenance including* Floors, Walls and Ceilings.



illustrations by the author

A Walnut Dining Table

Beading, Beveling, Stringing, & Compass Planing

faces of the three parts as flat and as smooth as possible. I prefer to do this almost exclusively with planes, but you may find it suits you better to work your way through a series of increasingly fine abrasive papers, using a belt sander.

Stringing

We're now ready for some fun. The stringing, which in this case is 1/8" ebonized inlay strips (which may be obtained in three–foot lengths from various suppliers such as Constantine, 2050 Eastchester Road, Bronx, N.Y., 10461), is most easily laid in grooves the same width as itself, but just a tad shallower. These grooves may be made using different methods, including special veining cutters, simple scratch stocks, or even wooden plough planes, but the simplest method is to use a moto–tool with a small router attachment. This tool has an adjustable fence, and it's a simple matter to set the fence and the depth gauge so that the groove is cut approximately 2–1/2" in from the edge, and just a little shallower than the thickness of the stringing. Square up and clean out the corners with a chisel, and then squeeze a bead of white or yellow glue into the groove. Cut strips of the inlay to length using square butt joints where lengths meet along the straight, and mitered joints at the corners, and press them in with a hard rubber or wooden roller. Wipe away any excess glue that may have been squeezed out, and allow it to dry thoroughly before planing or sanding flat. Sand carefully; if impatience gets the better of you, the inlay may end up below the surface of the table when the glue does dry and evaporating moisture shrinks the inlay.

Bearing this caveat in mind, it's a good idea to lay the top aside at this point and focus on the end pieces. These should be similarly surfaced or planed as flat and smooth as possible and then marked out for the curvature of the sides. The curve is actually quite shallow—being no more than 2" deep at its deepest point—but in order for the ends to give a feeling of lift to the top and balance at the bottom, this deepest point is located only 9" from the top. Using clamps or a helpful friend, position a thin strip of lath (or something else consistently pliable) so that a line may be drawn connecting the top and bottom of the sides with a mark 2" in from the side and 9" down from the top. Bandsaw as closely to this line as possible (use a bowsaw if you don't have a bandsaw), and then position the piece in the bench vice so that you can plane the sawn edge.

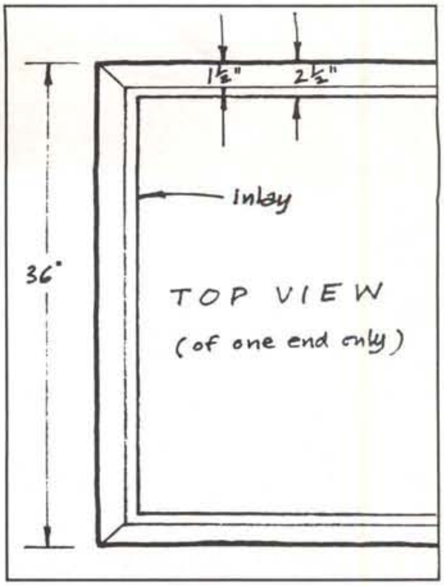
Compass Planing

Compass, or circular planes, are possessed of a wide range of peculiar characteristics, and while no amount of reading will take the place of personal experience with your own particular tool, a few general tips may be given. In order to avoid chattering, set the iron to take as thin a shaving as possible and make sure that the iron is held *firmly* against the bed by the cap iron, tightening the screw that holds this piece if necessary. Take extra care in ensuring that the iron is very sharp and ground straight across—you need no crown on this plane's iron since it invariably overlaps the work, and it is impossible to work the plane at a skewed angle. Although the flexible soles of metal compass planes are designed to form even curves, in reality there is often a flat spot right at the mouth. Resist the temptation to lower the blade, and instead increase the curvature of the sole when your iron won't reach the work.

In fact, this last point is the most important technique to bear in mind when compass planing: Adjust the depth of the iron only once—to take the finest shaving possible, but be prepared to adjust the curvature of the sole constantly as you remove more wood. This is particularly true with this table, since the curve to be planed is irregular and cannot be planed with one pass and one setting of the sole. Adjust frequently, and work from different directions according to the changing direction of the grain.

Once you have planed all four curves (two on each end piece), the end pieces are almost complete except for a length of stopped stringing that runs across the bottom outside face of each end about 2-1/2" up from the floor. The stringing is "stopped" because it finishes 2" in from each side. The point where it stops may be left round, shaping the end of the inlay to fit the rounded end of the groove, or it may be squared up with a small chisel.

There remains one final operation that you would only notice if it were left undone, which is to put a shallow arch in the bottom of each end piece so that they touch the ground only at their outside corners. Plane just enough to form a shallow curve, not noticeable to the casual eye, just enough to ensure a non–rocking table base, should the floor be less than perfectly flat.



Beveling

Back to the top: With a pencil gauge, mark a line 1-1/2" in from the edge on the top surface. Secure the top to your bench top using handscrews or other clamps, and starting with the ends, plane the bevel.

It will help considerably if you also make a pencil line around the edge of the top, to indicate the depth of the bevel. For a top that is 1-1/4" thick, a bevel that is 1/4" deep will be very effective and leave a vertical edge that is both substantial and in proportion.

Walnut Dining Table

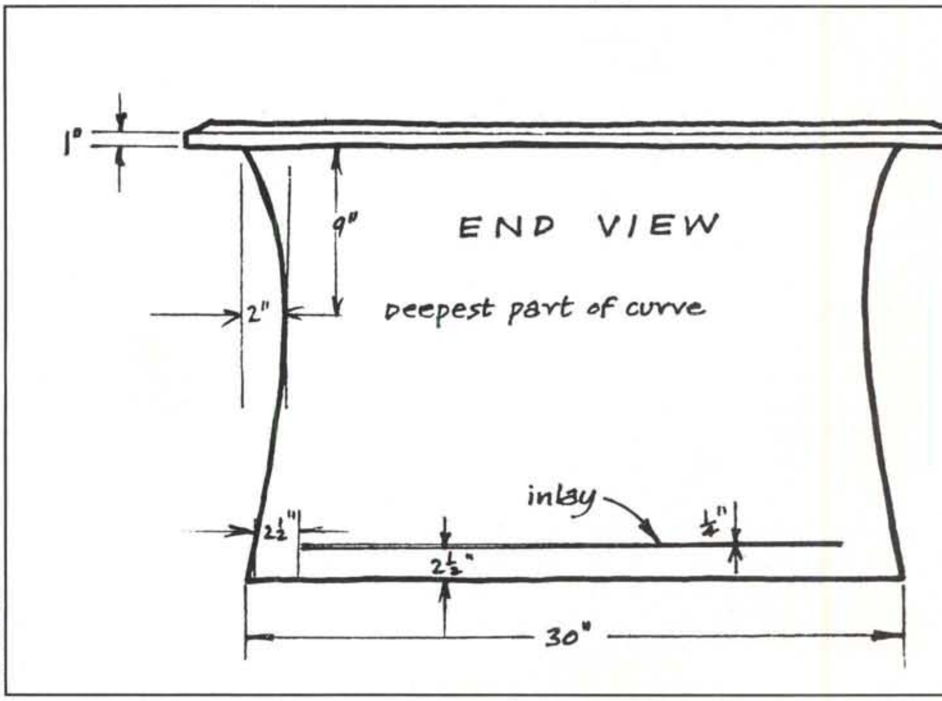
Cutting List

Qty	Part	Finished Size T	W	L	Piece
1	A	1¼"	36½"	78"	top
2	B	1¼"	30"	27½"	ends
2	C	1½"	3"	46½"	undercarriage sides
2	D	1½"	3"	27¼"	undercarriage ends
*	E	⅛"	⅛"	18'	stringing

Supplies

Qty	Item
10	#10 × 1½" round head screws
10	#10 washers
8	table fasteners
8	#8 ¾" round head screws

illustrations by the author



The Ends First

Although the top should be flat, clamping it to the bench with a few shavings under the center of the end will force a slight crown, just sufficient to allow you to plane right to the pencil line. If the top cupped—even slightly—you would not be able to do this, and the resulting bevel would have a curved edge. It looks best if the bevel is very crisp and all in one plane. The surface of the finished bevel should not consist of a series of facets, so each pass of the plane should be as complete as possible.

To prevent the ends from chipping, plane inwards from the sides. At the same time hold the plane severely skewed. Use the longest plane in your armory to get maximum sole on the work and yet maintain a skewed approach sufficient to produce a smooth cut.

Then the Sides

When both ends of the top have been beveled (and not before), plane the bevels on the sides of the top. There should be no difficulty in planing to both lines, or even in dealing with contrary grain (simply turn around and plane in the other direction), but what you *must* pay attention to now is the arris at the corners. An arris is the junction of two surfaces in different planes, in this case the side and end bevels. As you plane, watch that the outside end of the arris stops exactly at the corner of the tabletop, and that the inside end finishes right where the two pencil lines on the top intersect. Furthermore, make sure that the arris is a *straight* line. It is all too easy to end up with a curved arris that wanders off the edge of the table completely missing the corner. Go slowly and make each pass of the plane count. If you should overplane the mark, you will have to take more off the ends again.

Finally the Top

When the bevels are planed to your satisfaction you may turn your attention to leveling the stringing. You can sand this flat if you want to, but there is an added advantage in planing: it helps to define the top edge of the bevel. At this point you are ready for the final preparation of the top before applying the finish. Planing may have been sufficient, or you may want to polish with extremely fine abrasive. Gently round all the edges, perhaps with just a wipe of some 400–grit garnet paper.

Finish the stringing and edges of the end pieces similarly to the top, and then stack all three pieces safely out of the way: It is time for the undercarriage!

Holding It All Together

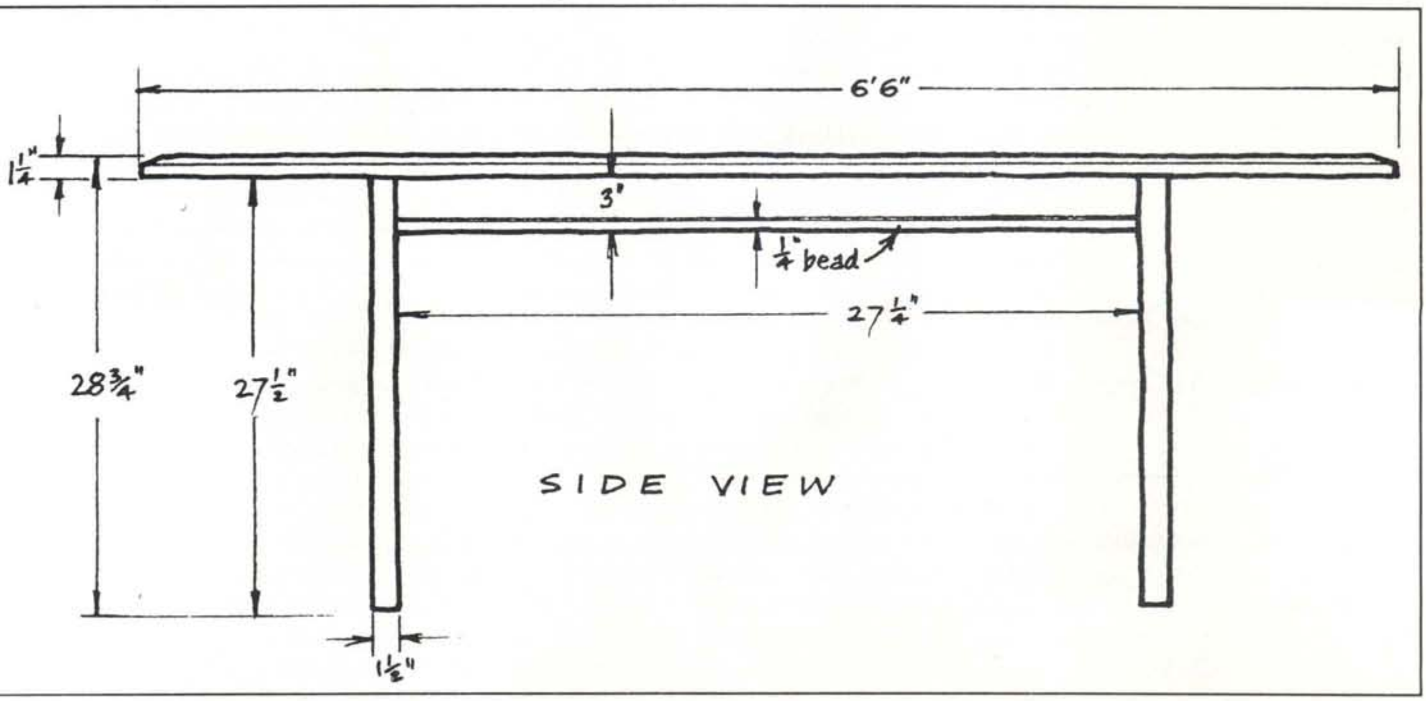
The undercarriage is the structural heart of this table, and yet is the least significant element in the design. All that is visible when the table is complete are the two relatively narrow rails.

Start by getting out four pieces all 3" wide × at least 1-1/2" thick. Any wider, and people might have difficulty getting their legs under the table, and any narrower or thinner and the support strength might be compromised.

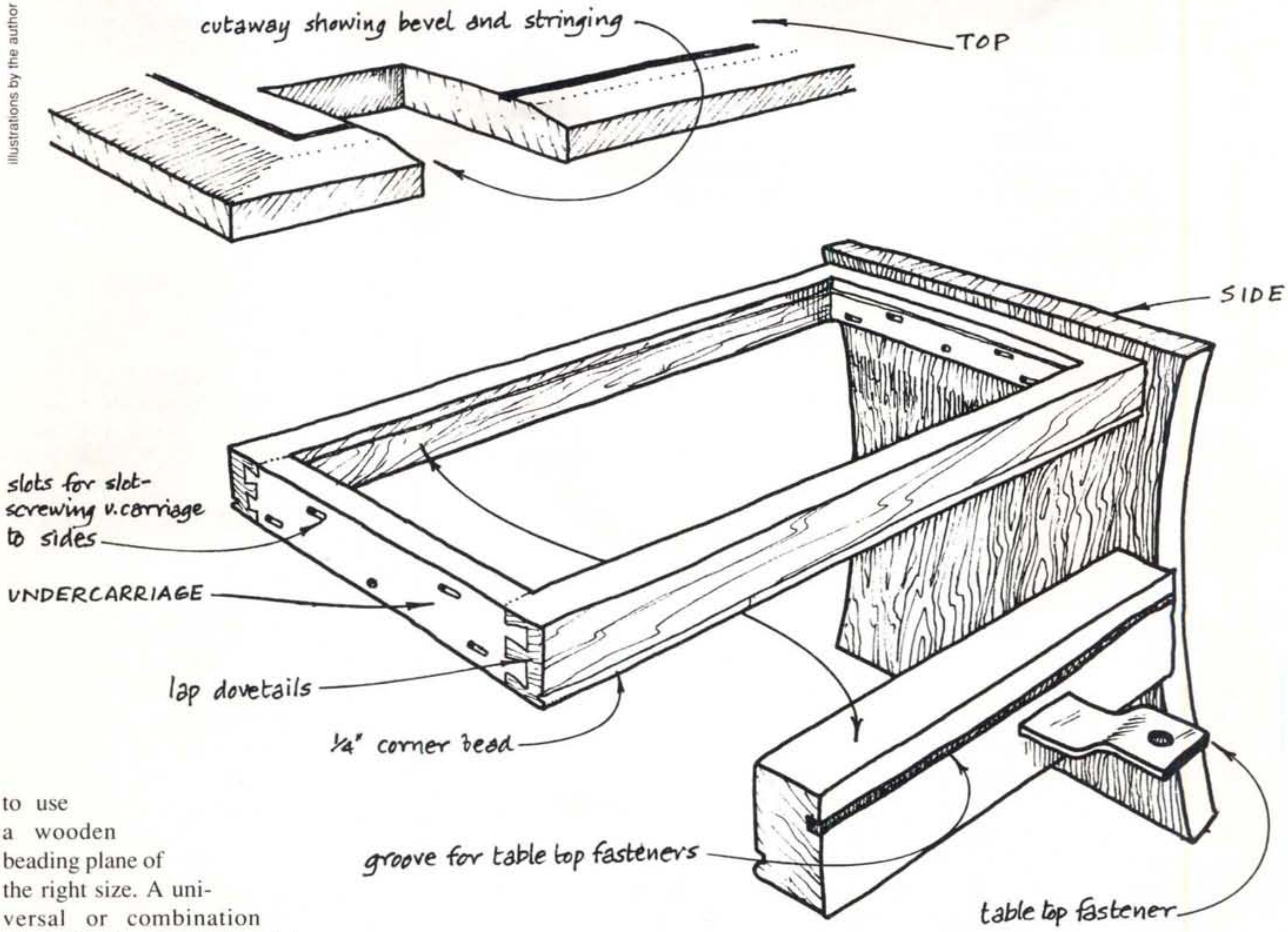
Plane the undercarriage sides (C) and ends (D) true and square, and lay out lap dovetails so that the ends are dovetailed into the sides, showing none of the joint on the sides. Even though none of this tricky joinery will show, do not get sloppy because the original purpose of dovetails is not to be flashy but to provide maximum strength. Just because no one will ever see these lapped masterpieces is no reason to think you can get away with a few loose pins—you need all the strength a well–cut joint has to offer. The undercarriage serves as support and a place to fix the top, and also provides lateral stabilization (like a stretcher) as well. These are fairly hefty pins and tails, so use your favorite technique to minimize the labor (drill much of the waste away where possible, for example). You will be cutting a 1/4" groove located 1/4" from the top edge on the inside face of the undercarriage for the table fasteners, so lay out the dovetails in such a way that this groove runs into a pin cavity and not a tail.

Beading

The 1/4" bead that runs along the outside bottom edge of the undercarriage sides has a dual purpose. First, it softens the edge, making it more comfortable to a leg pressed up to it and preventing an otherwise sharp corner from being damaged; and second, it provides an interesting line of shadow on an otherwise plain piece. It is not immediately noticeable, but is always enjoyable when finally discovered. It is also fun to make. The best method is



illustrations by the author


cutaway showing bevel and stringing
TOP
SIDE
slots for slot-screwing u.carriage to sides
UNDERCARRIAGE
lap dovetails
¼" corner bead
groove for table top fasteners
table top fastener

to use a wooden beading plane of the right size. A universal or combination plane also does an excellent job, especially if you are lucky enough to possess the auxiliary beading shoe originally supplied with the complete tool. Lacking either of these tools, or any other type of beading plane, you might use a router with a small veining bit and a fence set at 1/4". As a last resort for the tool–poor, you can always improvise a scratch stock—just a piece of scraper steel filed to the shape of the quirk that defines the bead, and set in a wooden handle.

Putting It All Together

Before finally gluing the pieces of the undercarriage together, make provision for the slot–screwing that will fasten the undercarriage ends (D) to the end pieces (B) as shown in the ilustration above. Five screws per end are enough, and the middle one does not need to be slotted. Use the biggest screws compatible with the thickness of the material; the threads should engage only the end pieces, and the shanks should slide in the slots of the undercarriage ends. When you do assemble the undercarriage, make sure that its ends (D) sit in flush (inside the side pieces) or else the ends of the side pieces (C) will not butt up tightly to the table ends.

With the undercarriage assembled, clamp the end pieces to the ends of the undercarriage and install the screws through the slots. Here the important thing is to keep the tops of the ends flush with the top of the undercarriage so that the tabletop will have a perfectly flat surface to sit on.

Making sure that the top is evenly centered on the assembled base is a matter of trial and error. First set the top on by eye, then gently tap the top until the overhangs at each end and both sides are matched. Clamp the top to the undercarriage at this point and use the metal table fasteners to hold it down.

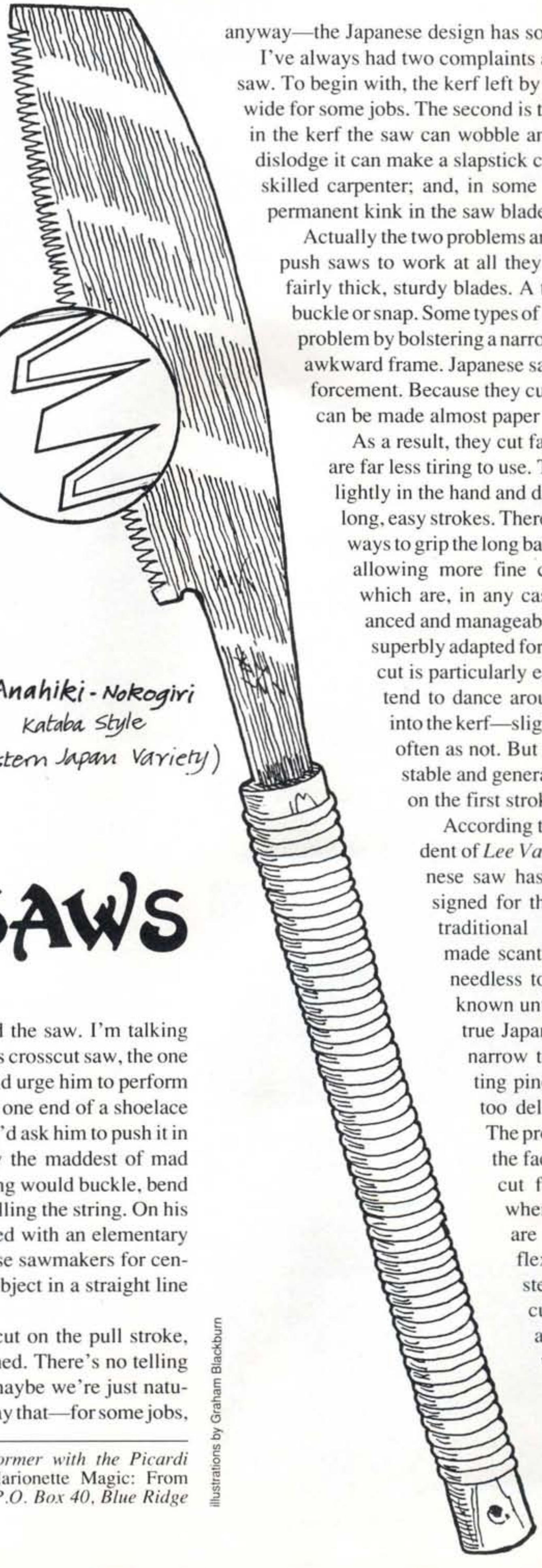
If you mark the ends and the top with a number or letter punch, reassembly in the same order can be guaranteed, and transportation becomes less of a hassle.

Finishing

The success of the finishing depends largely on the care exercised in the preparation, but do not overlook the necessity of finishing *all* surfaces equally, especially the underside of the top. This will minimize any tendency to warp, for any moisture content variation will be the same on both surfaces. One of the best treatments for a dining table is repeated thin applications of a penetrating oil like Watco®. *Let each coat dry thoroughly before applying the next.* Eventually a very durable gloss will build up that will withstand much water and alcohol. Should disaster strike, repairing this kind of finish is not too difficult. PW

JAPANESE HAND SAWS

by Bruce Taylor



Anahiki - Nokogiri
Kataba Style
(Western Japan Variety)

illustrations by Graham Blackburn

I'd like to meet the guy who invented the saw. I'm talking about the typical Western–style frameless crosscut saw, the one we all picture when we say "saw." I would urge him to perform a simple experiment. I'd have him grasp one end of a shoelace between his thumb and forefinger. Then I'd ask him to push it in a straight line across the tabletop. Only the maddest of mad inventors could fail to notice that the string would buckle, bend and twist. Then I'd suggest that he try pulling the string. On his first attempt he would become acquainted with an elementary principle that has been known to Japanese sawmakers for centuries: it's a lot easier to *pull* a flexible object in a straight line than to *push* it.

Japanese handsaws are designed to cut on the pull stroke, while Western saws are made to be pushed. There's no telling why Western saws go the wrong way; maybe we're just naturally pushy. But, having tried both, I can say that—for some jobs, anyway—the Japanese design has some definite advantages.

I've always had two complaints about the ordinary handsaw. To begin with, the kerf left by Western saws is just too wide for some jobs. The second is that when the blade binds in the kerf the saw can wobble and bend. The struggle to dislodge it can make a slapstick comedian out of the most skilled carpenter; and, in some cases, it can also put a permanent kink in the saw blade.

Actually the two problems are related. In order for the push saws to work at all they must be equipped with fairly thick, sturdy blades. A thin blade would simply buckle or snap. Some types of saws compensate for this problem by bolstering a narrow blade with a bulky and awkward frame. Japanese saws require no such reinforcement. Because they cut on the pull stroke, they can be made almost paper thin.

As a result, they cut faster, more precisely and are far less tiring to use. The Japanese saw is held lightly in the hand and drawn toward the body in long, easy strokes. There are several comfortable ways to grip the long bamboo–wrapped handles, allowing more fine control of the blades—which are, in any case, extremely light, balanced and manageable. As a result, the saw is superbly adapted for delicate work. Starting a cut is particularly easy. A Western saw will tend to dance around a bit before settling into the kerf—slightly off the pencil line, as often as not. But the pulled blade is more stable and generally cuts true to the mark on the first stroke.

According to Leonard G. Lee, president of *Lee Valley Tools Ltd.*, the Japanese saw has had to be partly redesigned for the Western market. The traditional Japanese woodworker made scant use of hardwoods and, needless to say, plywood was unknown until fairly recently. So the true Japanese saw had very long, narrow teeth, optimized for cutting pine. This made them a bit too delicate for harder woods. The problem is compounded by the fact that Japanese saws are cut from a very hard steel, whereas most Western saws are stamped out of a more flexible metal. This hard steel in the Japanese saws is cut with a diamond saw and then the teeth are individually honed. The result is a saw tooth that holds a razor–sharp edge but is very easily broken off. To make their saws sufficiently durable, Lee

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***Bruce Taylor** is a puppetmaker and performer with the Picardi Marionette Theatre, and the author of* Marionette Magic: From Concept to Curtain Call *(TAB Books Inc., P.O. Box 40, Blue Ridge Summit, PA 17214).*

Valley has them cut with shorter, wider teeth. This gives a more rugged version of the traditional tool without compromising cutting ability. To demonstrate the effectiveness of this implement Leonard Lee invites visitors to watch while he cuts 1/8" from the end of a softwood plank. First he attempts it with a Western dovetail saw, cutting across the grain. The saw leaves a fairly ragged edge, with plenty of pulled fibers hanging loose, and the wood crumbles as it is removed. Then he repeats the procedure with a Japanese backsaw. With a few quick strokes he lops off a slice so thin you can practically see through it. The edges are smooth and there are very few pulled fibers. It's a convincing demonstration.

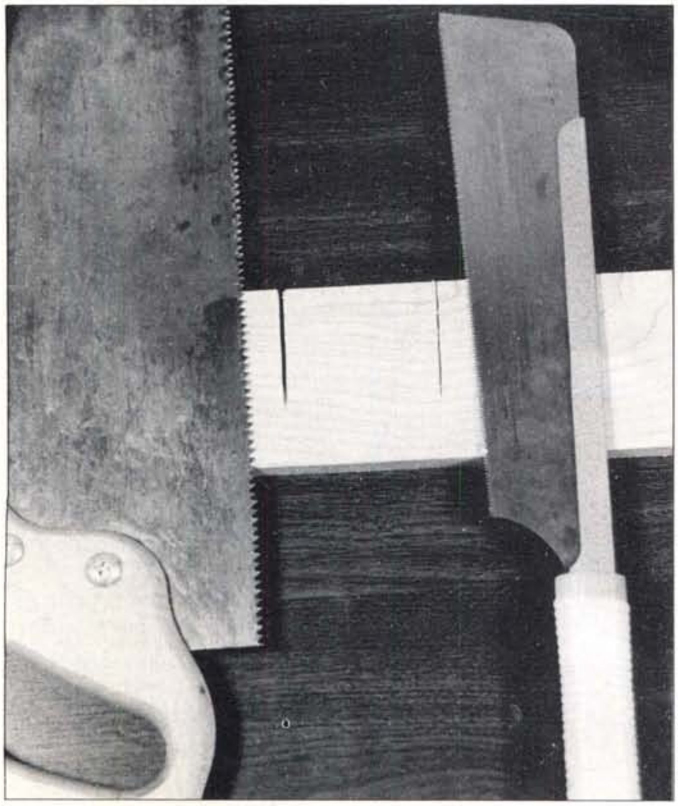
The Right Saw for the Job

Japanese saws are typically quite specialized, so you should choose one carefully according to the kind of work you plan to do. There are different designs for hardwoods, softwoods, plywoods, paneling, and green wood. Special variations on main types are available to do specific jobs, such as flush–cutting or cutting dovetail joints. The most popular shapes fall into three main categories: combination crosscut/ripsaws, backsaws and log saws.

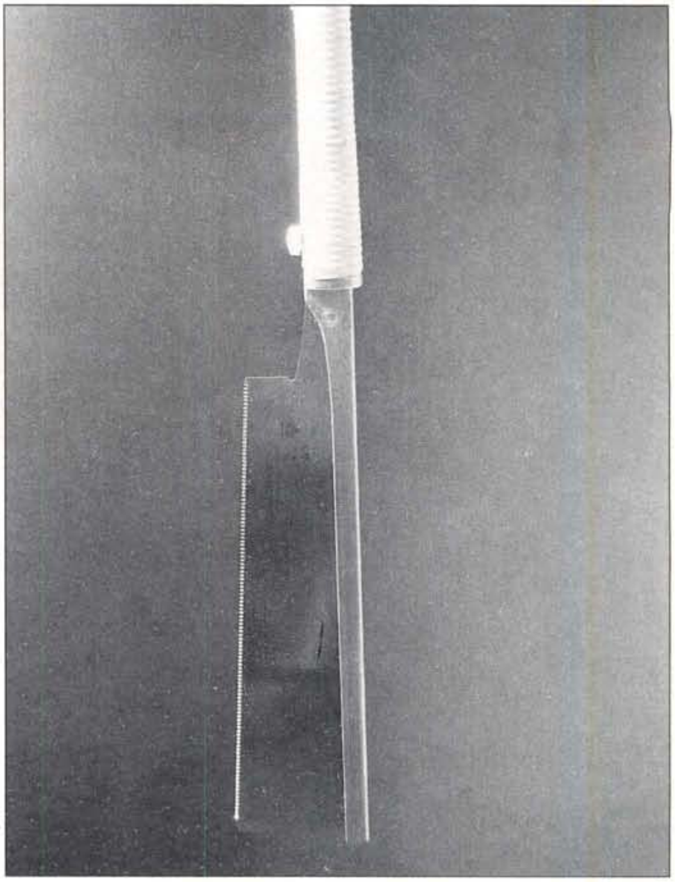
Ryoba: Combination Crosscut/Ripsaw

The most versatile of these handsaws is a combination cross/ripsaw, known in Japanese as a *ryoba*. This straight–edged saw is usually sold with a fairly short blade, between eight and thirteen inches long. One edge has a rip–tooth pattern; the other has crosscut teeth. The number of teeth per inch varies according to the size of the blade—the bigger the blade the fewer the teeth. There are usually about twice as many teeth per inch on the crosscut edge. This is the nearest thing to an all–purpose saw. It is quite suitable for cutting slots and large dovetails but can also be used for crosscutting lumber.

The saw kerf made by the typical Western saw (left) is much wider than that of the dozuki (right).



David Camp



Jeffrey Burr

Dozuki

Dozuki: Backsaws

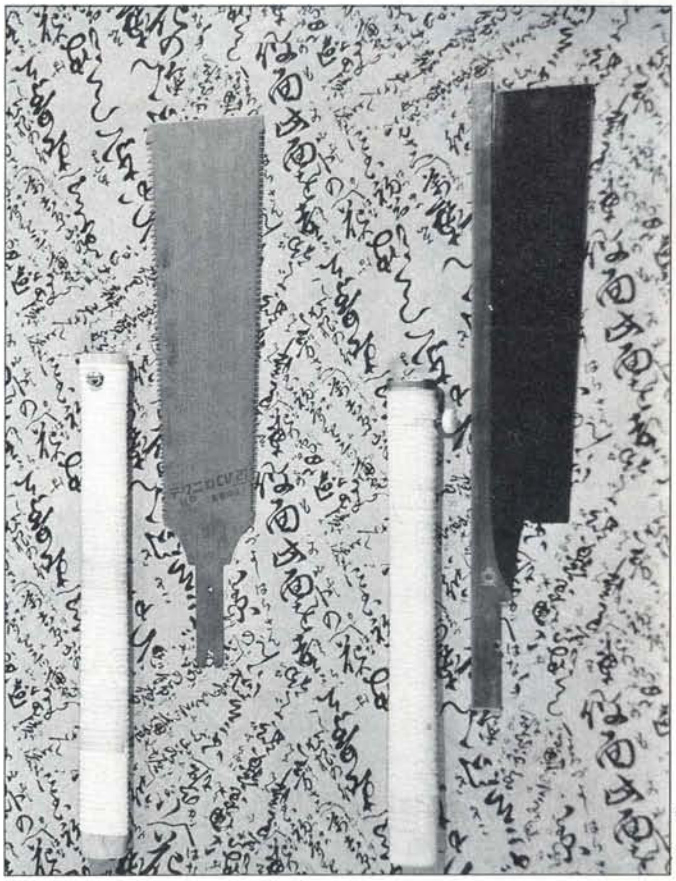
The Japanese backsaw, or *dozuki*, is an excellent tool for mitered cuts, notching, slotting and all kinds of joinery. The Japanese backsaw is held in one hand, and using it is a lot like slicing a loaf of bread. There is a daunting variety of these backsaws available. Although few retailers carry a full selection, choosing one is not necessarily easy. They have very fine teeth, and the steel is brittle, so if you use the wrong saw for the job you could end up with a gap–toothed or broken blade. Replacement blades are available, but not cheap, so it's a good idea to ask your retailer for details about the tooth patterns he has in stock. For example, a special type of *dozuki* with a shortened back frame and a thicker blade is available for cutting plywood.

Log Saw

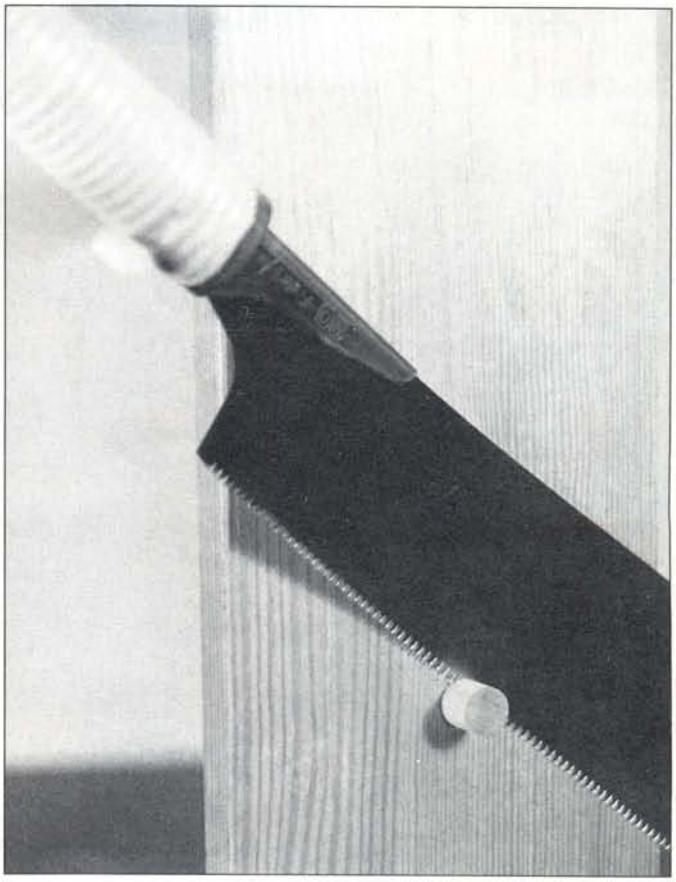
This kind of saw, known in Japanese as a *anahiki*, is for ripping or crosscutting logs or heavy lumber. These saws are generally more rugged than other types. They have no back support and have teeth on only one edge so that the top edge doesn't distort or enlarge the kerf when making a deep cut. The blades are usually around fifteen inches in length, though smaller sizes are available. They often have as few as five long, staggered teeth per inch.

Where to Find Them

Your corner hardware store may boast a stunning selection of Taiwanese crescent wrenches, but it probably does not carry fine Japanese woodworking tools. Fortunately, they are readily available from suppliers of specialized woodworking equipment. If there are no "fine tool" shops in your area you can order by mail from the companies listed on the following page.


Jeffrey Burr

Modern saws commonly feature replaceable blades. Shown are dozuki (left) and ryoba (right).


David Camp

The thin, flexible blade can bend to cut flush in hard–to–reach places.

Aqua Sharpening Stone & Tools, Inc.
1129 Solano Ave., Dept. PW
Albany, CA 94706
(415) 525-8948

Garrett Wade Company, Inc.
161 Avenue of the Americas, Dept. PW
New York, NY 10013
(212) 807-1155

Albert Constantine and Son, Inc.
2050 Eastchester Rd., Dept. PW
Bronx, NY 10461
(800) 223-8087

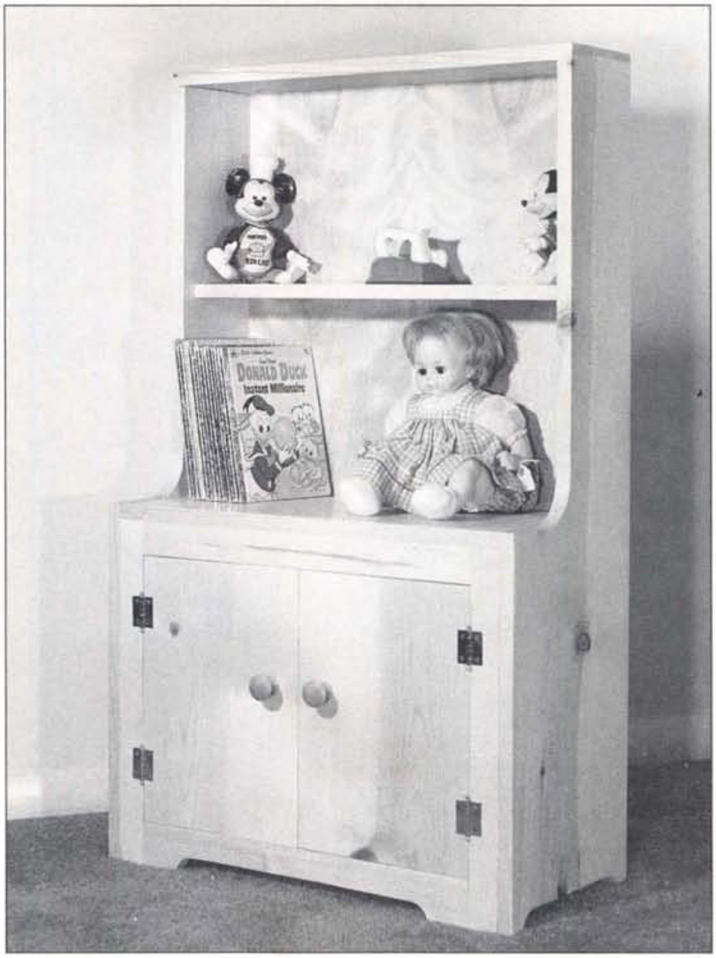
The Fine Tool Shops
20 Backus Ave.
PO Box 1262, Dept. PW
Danbury, CT 06810
(800) 243-1037

Hida Tool & Hardware Co., Inc.
1333 San Pablo Ave., Dept. PW
Berkeley, CA 94702
(415) 524-3700

Lee Valley Tools, Ltd.
1080 Morrison Drive, Dept. PW
Ottawa, Ontario
K2H 8K7
Canada
(613) 596-0350

A Popular Woodworking Project

Child's Cupboard



photos by the author

by Jacob Schulzinger

This 40" tall pine cupboard is just the right size for children to store their books and toys in or use as play furniture. The fixed shelving is joined with sliding dovetails to make the final assembly much easier. In addition, the dovetailed shelves eliminate the need for clamping up the carcase and for fasteners to hold the shelves in position.

Start by cutting the two sides (A) slightly longer than the dimension given in the cutting list. The sides must be flat, as any excessive cupping will cause the sliding dovetails to bind when the shelves are installed. Carefully identify the boards for right and left sides, front and back edges, and inside and outside faces to prevent errors when laying out and cutting the slots for the shelves. Lay out the centerlines for the shelves as shown in Figure 1. Take each measurement from the top end of the sides to ensure alignment. Again referring to Figure 1, measure from the back edge to mark the length of the stopped dovetail channel. The shelves are designed to extend 1/2" beyond the ends of the stopped slots.

Set up the router with a 1/2" dovetail cutter set to a depth of 5/16". Make a sample cut on a piece of scrap wood and save this sample for checking the fit of the dovetail tenons. Rout all of the stopped dovetails. [*Editor's Note: For best results, make one pass with a straight-cutting bit to remove much of the waste before routing the dovetails.*]

Lay out and drill two 2" diameter holes at the bottom of each side board, cut the overall length to finished size and complete the two cutouts with a sabre saw. Bore two 4" diameter cutouts for the 5" setback with a fly–cutter and finish the cutouts with a sabre saw. When using the fly–cutter, you should drill halfway through the material from each side to reduce tearout. You must use a drill press for this operation and should clamp the boards securely to the drill press table for safety. Dress up the edges with a cabinet file and sandpaper before continuing.

Cut the three shelves (B, C, and D) and the bottom (E) to their finished lengths of 22-1/8" (21-1/2" plus two tenons that are each 5/16" long) and then rip to the widths shown on the cutting list.

Use some scrap lumber from the shelves (same thickness) to set up the router for cutting the dovetail tenons. Check the test cuts for size against the sample channel you made earlier. They should fit firmly together. When you cut the shelves, each joint should then be hand–fitted with a chisel and carefully marked with its mate to make the final assembly run smoothly.

After cutting the tenons, trim back the leading edge of each by 5/8". This trimming will allow the forward edge of each shelf to extend past the stopped slots. I suggest that you cut out any knots found on the male dovetails because these areas are too dense to sand for final fit. Cut the cabinet top (F) to size and rout a 3/8" deep × 3/8" wide rabbet on each end. Cut matching rabbets at the top ends of the sides (A), then reset the router to cut 3/8" deep × 1/4" wide rabbets along the back edges of all three pieces, to accept the back (G).

Assemble the basic cabinet with glue by installing a single shelf at a time between the two side boards. Put a small amount of glue in each dovetail slot and push each shelf into position. Start at one end of the unit and work your way down, one shelf at a time. After all shelves are in place, adjust the position of each so that their back edges are flush with the rabbet that was cut for the back panel.

Install the cabinet top with a few 4d nails, and then check the squareness of the

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***Jacob Schulzinger** is an industrial engineer in the aerospace industry. Woodworking is his part-time business and hobby.*

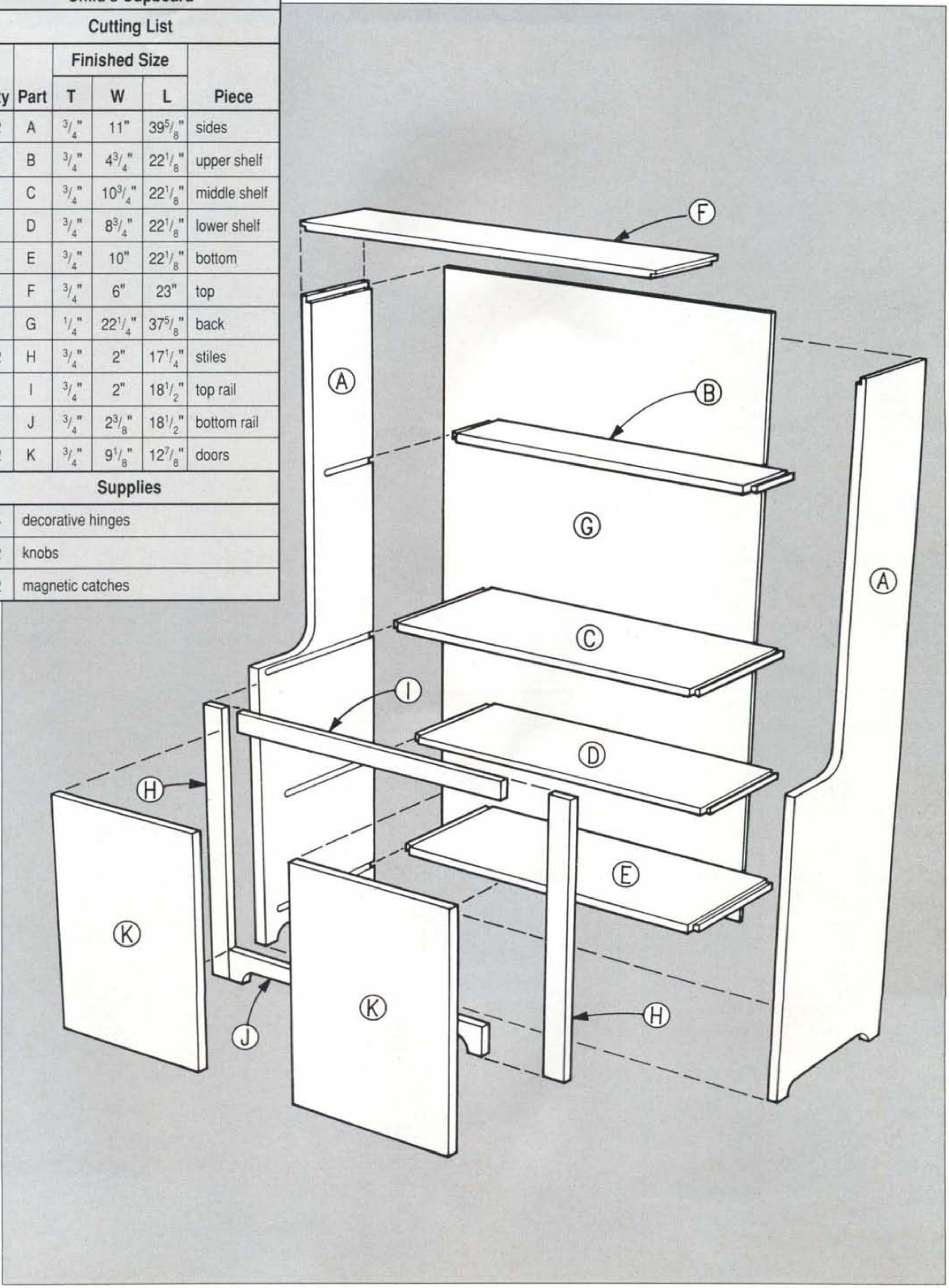
Child's Cupboard

Cutting List

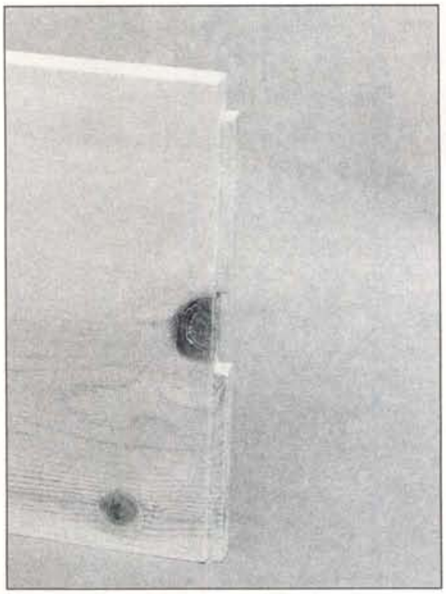
Qty	Part	Finished Size T	W	L	Piece
2	A	3/4"	11"	39 5/8"	sides
1	B	3/4"	4 3/4"	22 1/8"	upper shelf
1	C	3/4"	10 3/4"	22 1/8"	middle shelf
1	D	3/4"	8 3/4"	22 1/8"	lower shelf
1	E	3/4"	10"	22 1/8"	bottom
1	F	3/4"	6"	23"	top
1	G	1/4"	22 1/4"	37 5/8"	back
2	H	3/4"	2"	17 1/4"	stiles
1	I	3/4"	2"	18 1/2"	top rail
1	J	3/4"	2 3/8"	18 1/2"	bottom rail
2	K	3/4"	9 1/8"	12 7/8"	doors

Supplies

Qty	Item
4	decorative hinges
2	knobs
2	magnetic catches

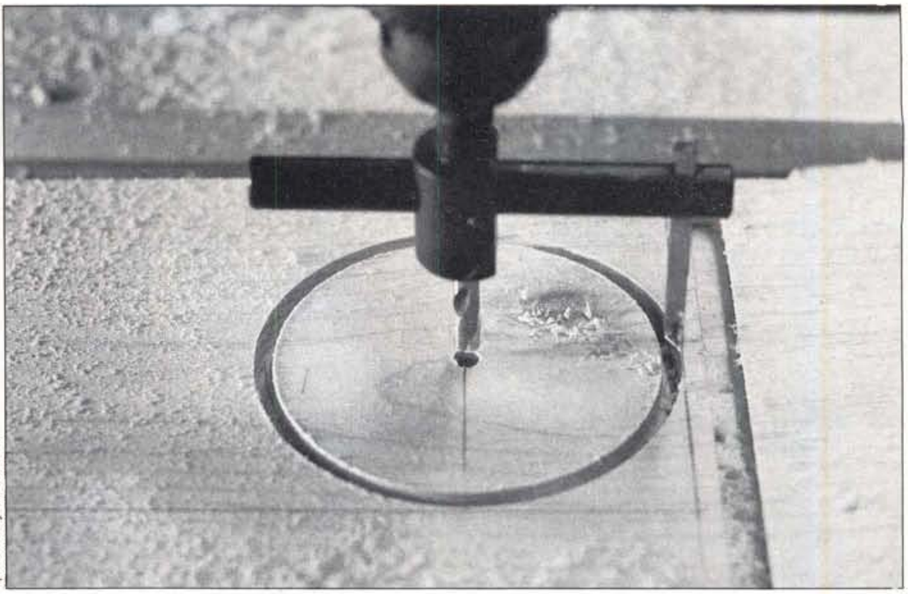


illustrations by Tom Larson



If there are knots in the dovetail tenon area, remove that portion of the tenon so it doesn't bind in the dado.

photos by the author



Use a fly–cutter to make the curves in the profile of the sides and the bottom rail, then cut the straight portions with a sabre saw.

total assembly. To correct any out-of-square condition, run a bar clamp diagonally to pull the case into square.

Cut the stiles (H) and the top and bottom rails (I and J) a bit wider than indicated in the cutting list, but to their finished length. Drill the ends of the rails for dowels and position them between the stiles so the opening for the doors will be 13" high.

Before you glue the frame together, drill a pair of 2" diameter holes in the bottom rail to form the radii for the cutout, then rip the two rails to their finished width. Use a sabre saw to complete the cutout, and then glue the frame together. When it's dry, fit the frame to the opening by trimming equal amounts off each stile. Glue the frame assembly in place and allow it to dry.

Cut the back (G) and the doors (K) to size, but don't install them until all the components are sanded and finished. I chose a satin varnish for this project, but you can stain or paint yours as desired.

Use decorative hinges to attach the doors to the face frame, add some knobs, and mount some magnetic catches on the inside to hold the doors closed. **PW**

Figure 1

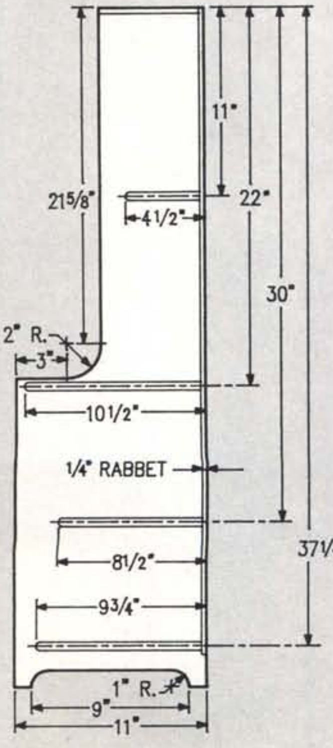
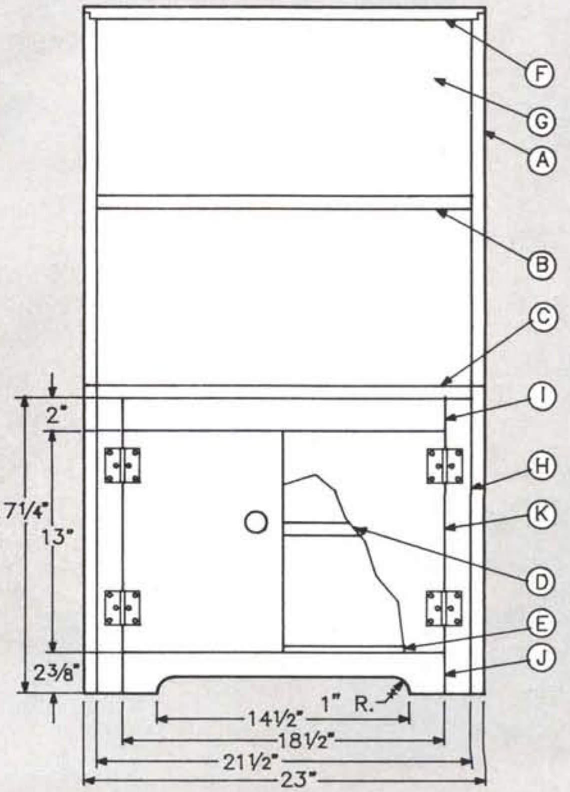


Figure 2



illustrations by Tom Larson

Creating *Motion* in Sculpture

by William H. McMaster

Woodcarving can be either an art or a craft. The distinguishing factor is in the design. Too many patterns that wood carvers use have no life in them. They present the subject as too static and symmetrical. One thing that stands out in an art object is the sense of motion implied by the sculptor. How to achieve this in your carving is the subject for this issue.

Human and animal locomotion were extensively photographed by Eadweard Mulbridge. Originally published in 1887, these photographs have recently been republished by Dover as the book *Animals in Motion*. Looking at Mulbridge's many pictures of people and animals in motion reveals that the body goes through all sorts of positions, but most of these poses—even as photographed instantaneously—do not convey the idea of motion. In fact, most stop–action poses obtained by photography appear rigid and cannot be used directly for sculpture. Instead, they should be used only as a reference.

Movement is a *transition* and both photography and sculpture are static representations, so how does a woodcarver solve this problem?

Movement is represented through the use of certain artistic principles of mobility that create an illusion of motion. To be successful, you must utilize these techniques in your design, otherwise your work will look static and dull.

Mobility

Mobility is created through the use of an **axis of reference** and **lines of rhythm.** When designing your carving, draw these lines first and then arrange the objects and forms around them. Then test out your ideas with a clay model before committing yourself to the wood. This clay model is one of the most important steps in carving an original work.

Illustrations by the author

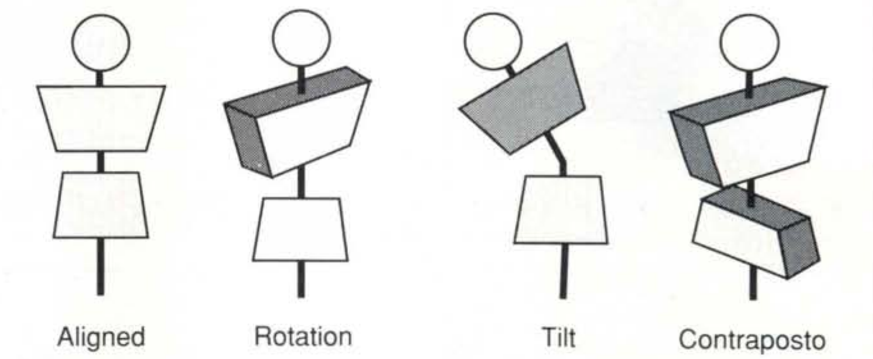


Figure 1. Relationship to Axis of Reference

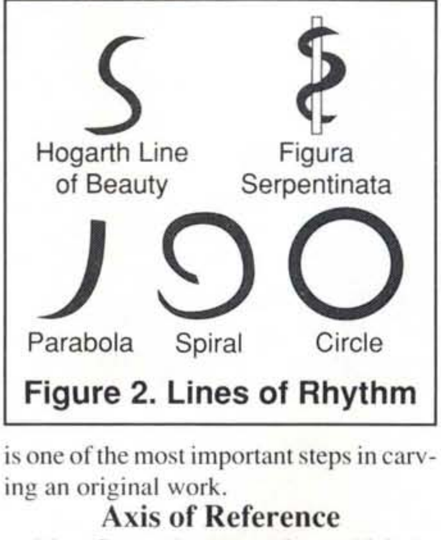


Figure 2. Lines of Rhythm

Axis of Reference

Most figures have an axis to which the various parts can be related. The parts can be aligned with this axis, rotated about it, or tilted away from it. Figures aligned with the axis give a feeling of stiffness and are usually uninteresting (although in some cases a feeling of serenity is developed this way, as in many religious carvings.) A sense of mobility is imparted by rotating and tilting in relation to the axis. **Contraposto** is the type of rotation where different portions of the figure are rotated in opposing directions. It imparts a feeling of restlessness or strain. This technique, developed during the classical period of Greek art, was much admired by the Renaissance artists, and used by Michelangelo in many of his sculptures.

Figure 1 illustrates with stick figures the use of the axis of reference in positioning the human body. When we did the carving of a human head in previous issues (Issues 28–33), the head of the young woman was rotated around the axis of the body. In our carving of the Arabian stallion (Issues 36–38), the head was both tilted and rotated.

Lines of Rhythm

Rhythm engages the movement of the eye over the piece by means of the regular recurrence or natural flow of its related elements. The movement of the viewer's eyes must be drawn over the piece in a pattern preconceived by the artist. This is achieved by the flow of lines through the subject. These lines are either real or implied. Implied lines are imaginary lines formed by the design and are present only in the mind of the viewer. They are formed by lines or contours which can be extended or made to flow into one another and thus add unity, grace, and rhythm. Real lines must be carefully conceived and carved. A broken curve, a ragged circle, or an uneven line that was intended to be even will do much to spoil the artistic quality of a work. We must also be aware

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***William H. McMaster** is Chief of the Education Division of the California Carvers' Guild. His "Focus on Carving" is a regular feature in* PW.

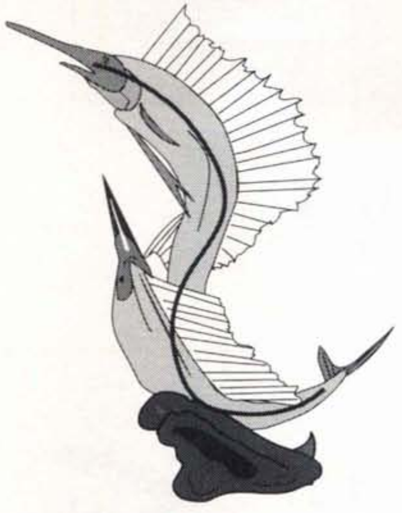


Figure 3.
S–Curve Line of Rhythm

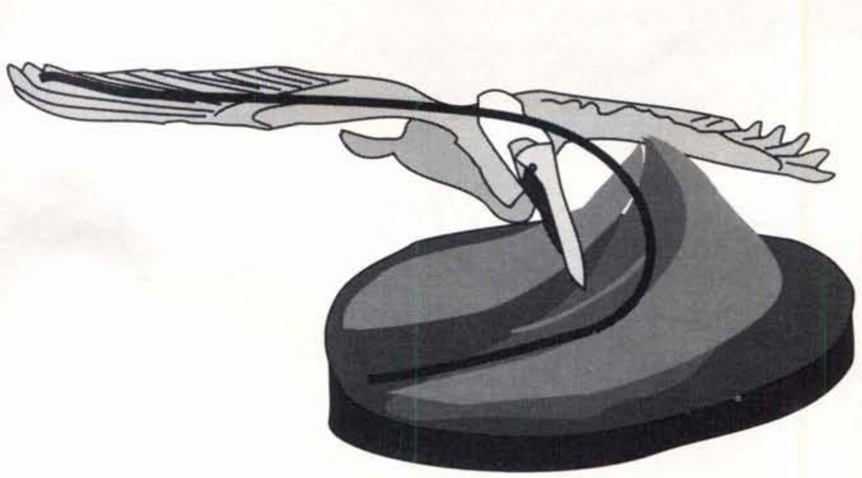


Figure 4. Parabolic Line of Rhythm

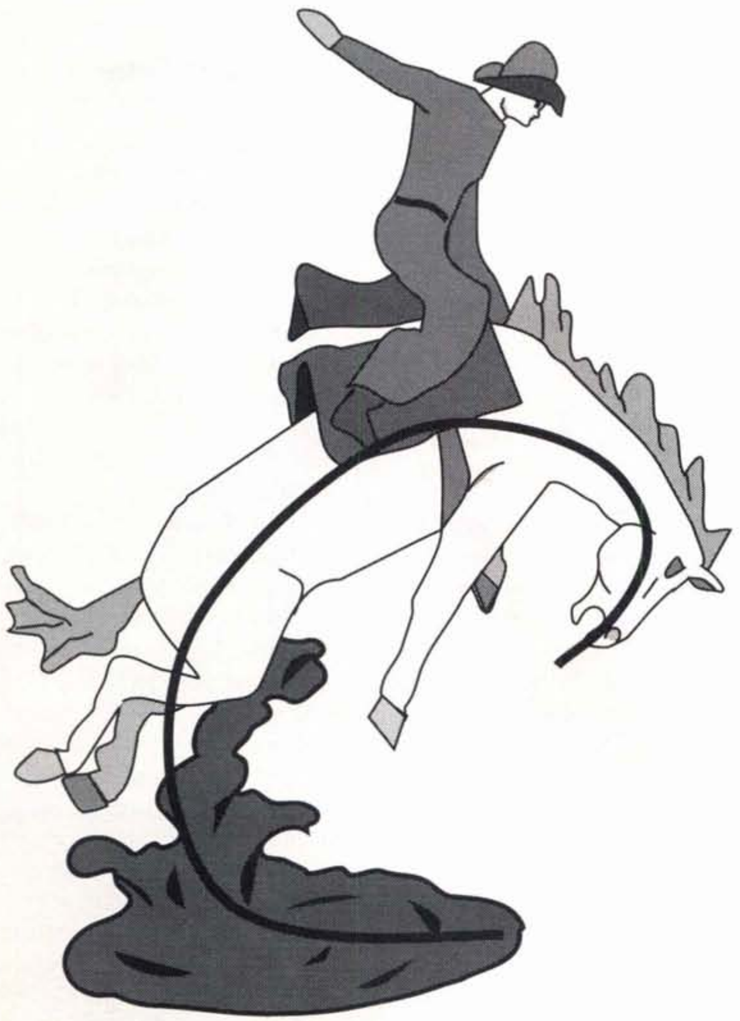


Figure 5. Spiral Line of Rhythm

of unwanted lines, real or imaginary, that could spoil the design. The eye will quickly pick up on these and, true to Murphy's Law, will always misinterpret them.

Thus, rhythm suggests repetition, flow, or cycles which are related to the plan of the sculpture. These lines of rhythm give a sense of follow–through and a cohesiveness to the carving. A lack of rhythm in a carving results in a jerky, uneven, or disorganized movement.

There are several such lines of rhythm that can readily be identified and lead to a graceful design. These are illustrated schematically in Figure 2 and in the representational sketches of real sculptures in the following figures.

The **"Hogarth Line of Beauty"** (named for 18th century English artist William Hogarth) is a line that gracefully curves in one direction and then reverses itself. It is the well recognized "S" curve and is the basis of many successful sculptures. We used it in shaping the mane of our Arabian stallion (*PW* #38 August/ September 1987), and it is the underlying design feature of Kent Ullberg's "Wind in the Sails" shown in Figure 3.

Figura Serpentinata is the spiraling of forms about a central axis. Here we have a line that starts at a point and then swings around the axis in a circular movement. In order to see the whole sculpture, the viewer is forced to circle around to see all the points of interest. This is one of the more difficult designs to create and unfortunately we do not see many contemporary works using this very effective technique.

The **Parabola** is a line whose sweep is continually bending into a greater curve. It does not double back upon itself. Bill Hunt's "Skimming the Waves" in Figure 4 has the brown pelican and an ocean wave following this pattern.

The **Outward Spiral** is a circular pattern with an ever–increasing radius. "Twister & Outlaws" by Grant Speed, shown in Figure 5, illustrates this line of rhythm.

A **Circular Line** is one which sweeps around and then returns to the starting point. The result is a never–ending continuous line that holds the interest of the viewer. This line of rhythm was used by James Muir in his dramatic "Saving the Flag" whose design is shown in Figure 6.

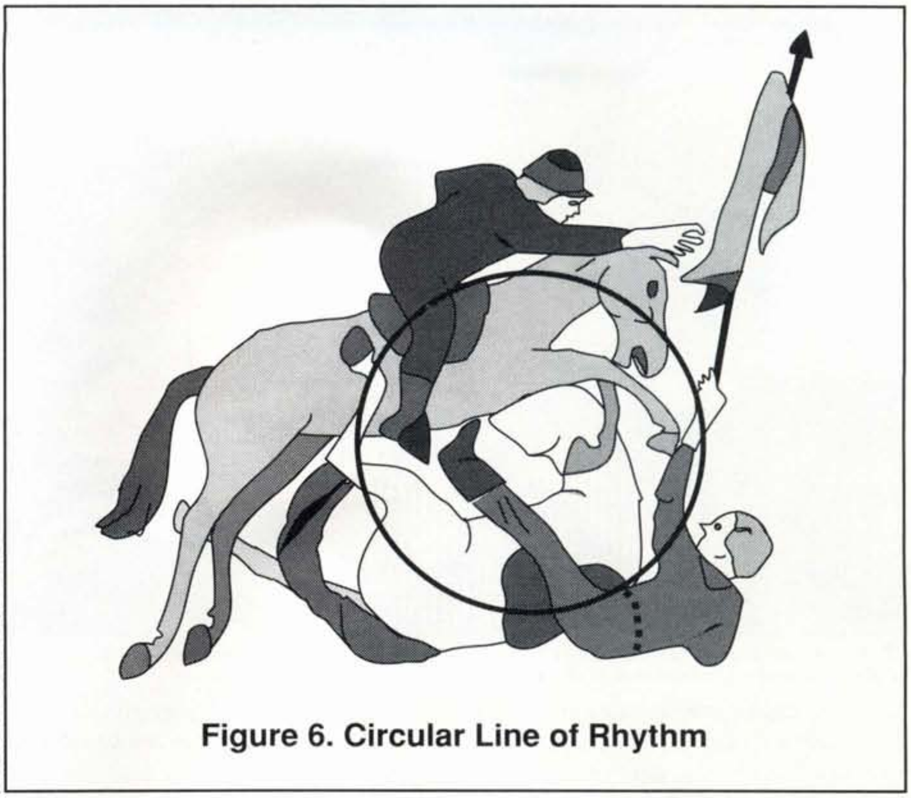


Figure 6. Circular Line of Rhythm

photos and illustrations by the author

The Illusion of Motion

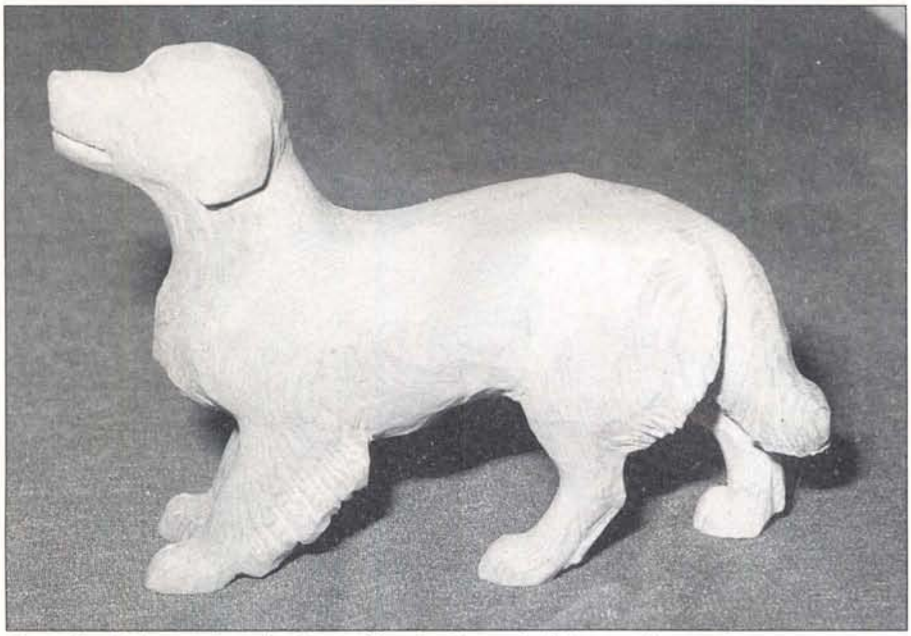
Motion involves a transition from one position to another. The problem, then, is how to represent it so that the result does not look frozen in time. We must give the impression of continuity; the viewer must have a feeling of what went on before and what is about to happen. As I mentioned earlier, this rarely happens in a stop–action photograph. As Fredrick Remington said, "The artist must know more than the [camera] ..."

There are seven recognized methods that sculptors have used to create an ***illusion of motion.*** These methods will be discussed separately, although in practice a sculptor will usually combine techniques in a single carving.

Symbolic Motion is a technique that relies on the use of external aids to indicate the motion. The familiar props are flowing drapery, wind–blown hair, and water waves. I used this technique in the design of the mane of the racing Arabian Stallion, and water waves were used to show the motion of the duck in the Columbia panel (Issues 39–42). Hal Roach's swimming dolphin (below) uses both carved waves and the texture of the curly maple to convey this effect.

Imminent Motion is a static pose where the subject is contemplating the next move. The most famous example of

The figure of the wood and the carved waves create Symbolic Motion in Hal Roach's carving of a swimming dolphin.



Peggy Steffen's carving of a dog waiting to chase a ball is a good example of the technique of Imminent Motion.

this is Michelangelo's statue of David. The wood carving of the dog by Peggy Steffen (photo above) also uses this type. We can just *see* him waiting for a ball to be thrown.

Anticipatory Motion uses an action pose just before or after a recognized phase of motion and relies on the observer's imagination to complete the action. This involves the viewer in the action and is a very effective tool for increasing interest in your work. As an example, two commonly used poses for eagles are swooping down to catch its prey and taking off after catching prey. Diana Kwan's relief of the eagle catching a fish (below) illustrates the first phase of the action.

Simulated Motion is quite similar to anticipatory motion but is described as the portrayal of rhetorical violence, the representation of a vigorous action at the moment of greatest strain or tension. For examples consider the hurling of a spear, throwing a discus, or the brandishing of a sword. Ellis Gilbert's copy of the famous statue of the discus thrower (right) shows this type of action.

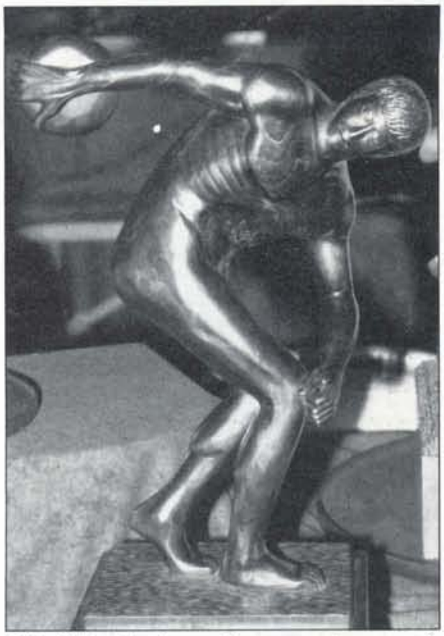
Sequential Rhythm shows several figures, each portraying a different phase of the action. These are usually sequential phases so that the observer can see how the motion progresses. Bob Hebert's relief carving of the Canada geese (far right) shows a good example of this technique.

Transitional Movement is the approach pioneered by the French sculptor Auguste Rodin who, rather than using different figures, chose to show a single figure displaying various sequential poses. This method combines stages of motion to give a feeling of flowing movement.

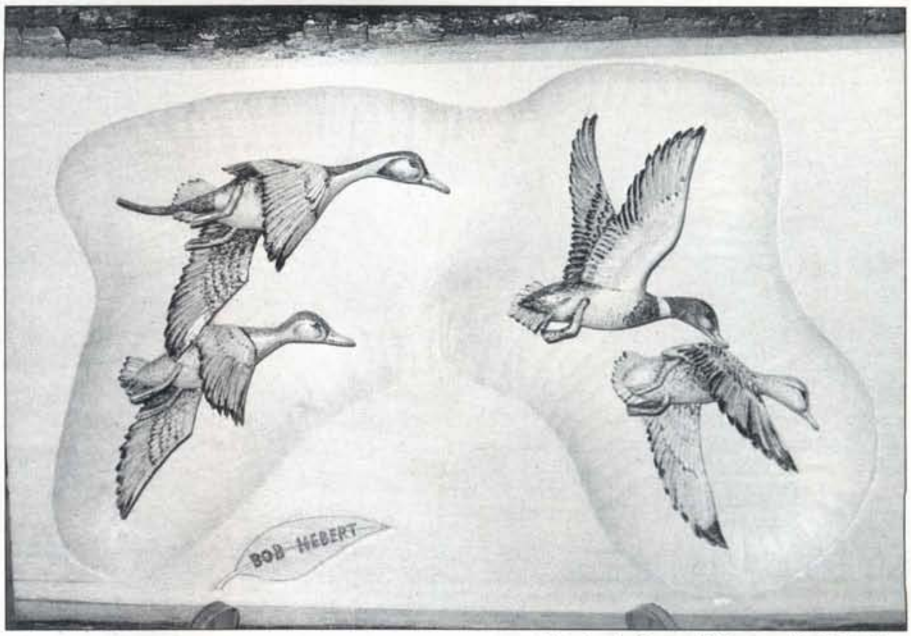
The problem with this approach is that you must make sure that each position is anatomically correct, that the pose is characteristic, and above all, that the combination is believable. In this case you are giving your own artistic interpretation of the movement and not just a stop–action copy of nature.

This last method suggests that since you cannot make the carving move, make the observer move around it in order to see it all. This **Moving Viewpoint** approach

The technique of Anticipatory Motion is demonstrated in Diana Kwan's relief carving.



Ellis Gilbert's discus thrower makes use of the technique of Simulated Motion.



The technique of Sequential Rhythm is shown in Bob Hebert's relief carving of Canada geese.

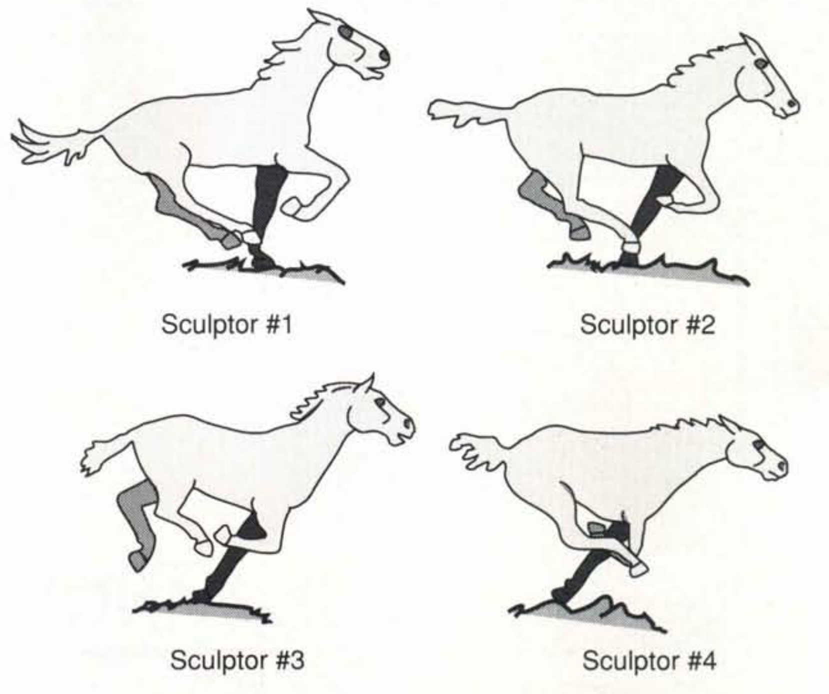
is the technique of Figura Serpentinata. One effective use of this method that I've seen was a sculpture of a column of horses and riders descending a mountain. The column circles around the piece and we see the horses in various phases of the walk. To catch all the action you are forced to walk around the sculpture and view it from all angles.

Applying the Methods

To study the use of these techniques for creating the illusion of motion, let us consider Figure 7 which shows four different sculptor's interpretations of a horse at a gallop. The poses take place only fractions of a second apart as you can tell by the position of the pattern of the supporting left front leg. The basic technique here is the use of **anticipatory motion** since the pose is that of the gallop just before it goes into its phase of full suspension. Three of the sculptors have used the technique of transitional movement. Can you tell what is going on in each version? What pose represents the actual motion of the horse, and which is a pose that is impossible for a horse to attain? In your view, which one gives the best representation of the motion?

Looking at these sketches individually and comparing them to the stop–action photographs of Mulbridge we can dissect each design. We see thatSculptor #1 has positioned the hind legs at the end of the suspension phase just before the right rear hoof lands, and the raised foreleg is depicted at a few moments before the suspension, so that the motion depicted flows from front to rear in three sequential poses. Sculptor #2 has positioned the three elevated legs in a pose representing full suspension, so his interpretation shows only two phases of the action. Sculptor #3 has used a stop–action pose and rendered the horse anatomically correct for this pose. Sculptor #4, who should have known better, has positioned the rear legs in a position possible for a greyhound but not a horse. Such an exaggeration is all right for a caricature, but not a realistic sculpture.

The design of a carving is probably the most important step in its creation. I hope these comments on the techniques used to create a feeling of motion will help you to design your carvings which show life and action. PW



Sculptor #1

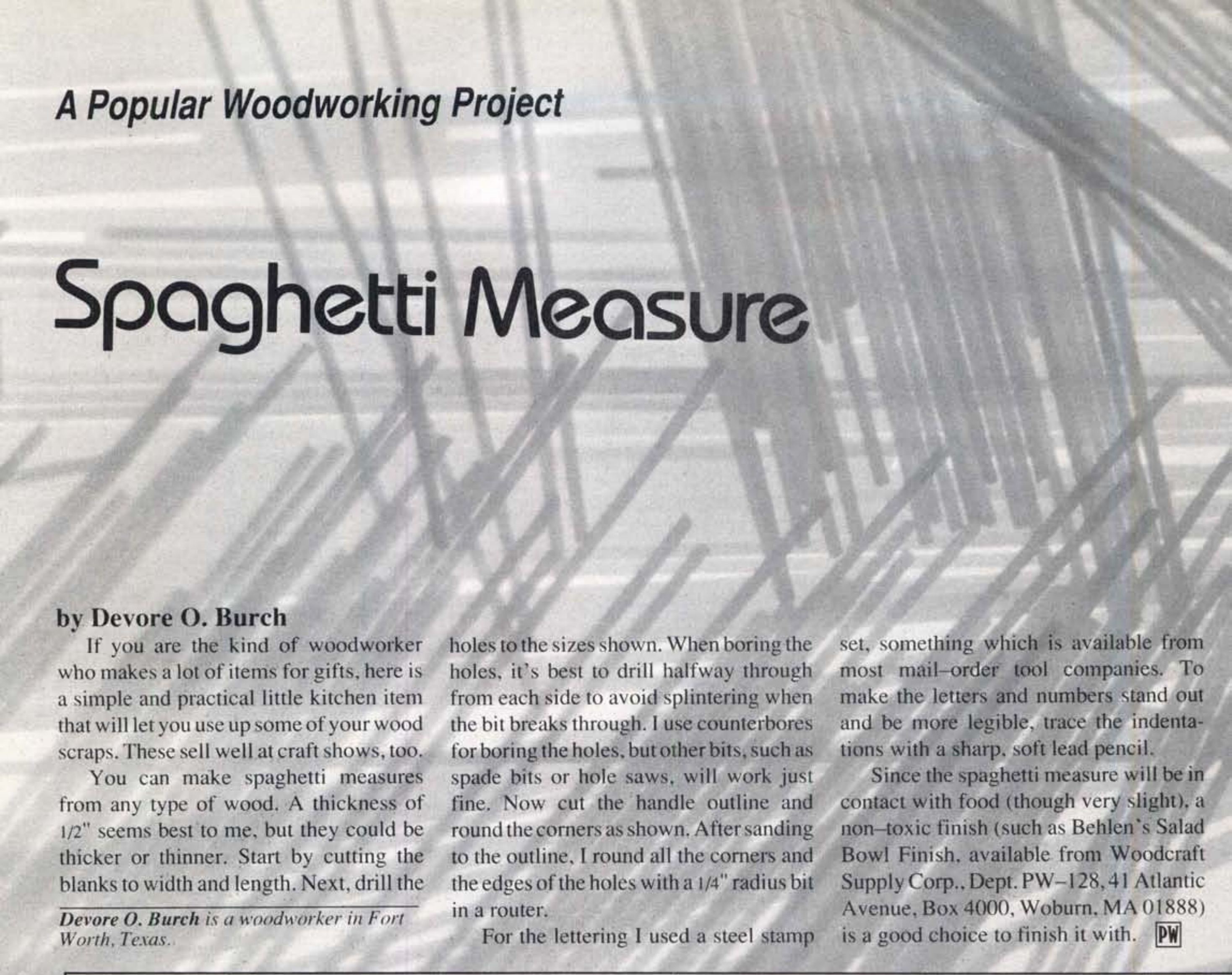
Sculptor #2

Sculptor #3

Sculptor #4

Figure 7. Interpretation of the Gallop

photos and illustrations by the author



A Popular Woodworking Project

Spaghetti Measure

by Devore O. Burch

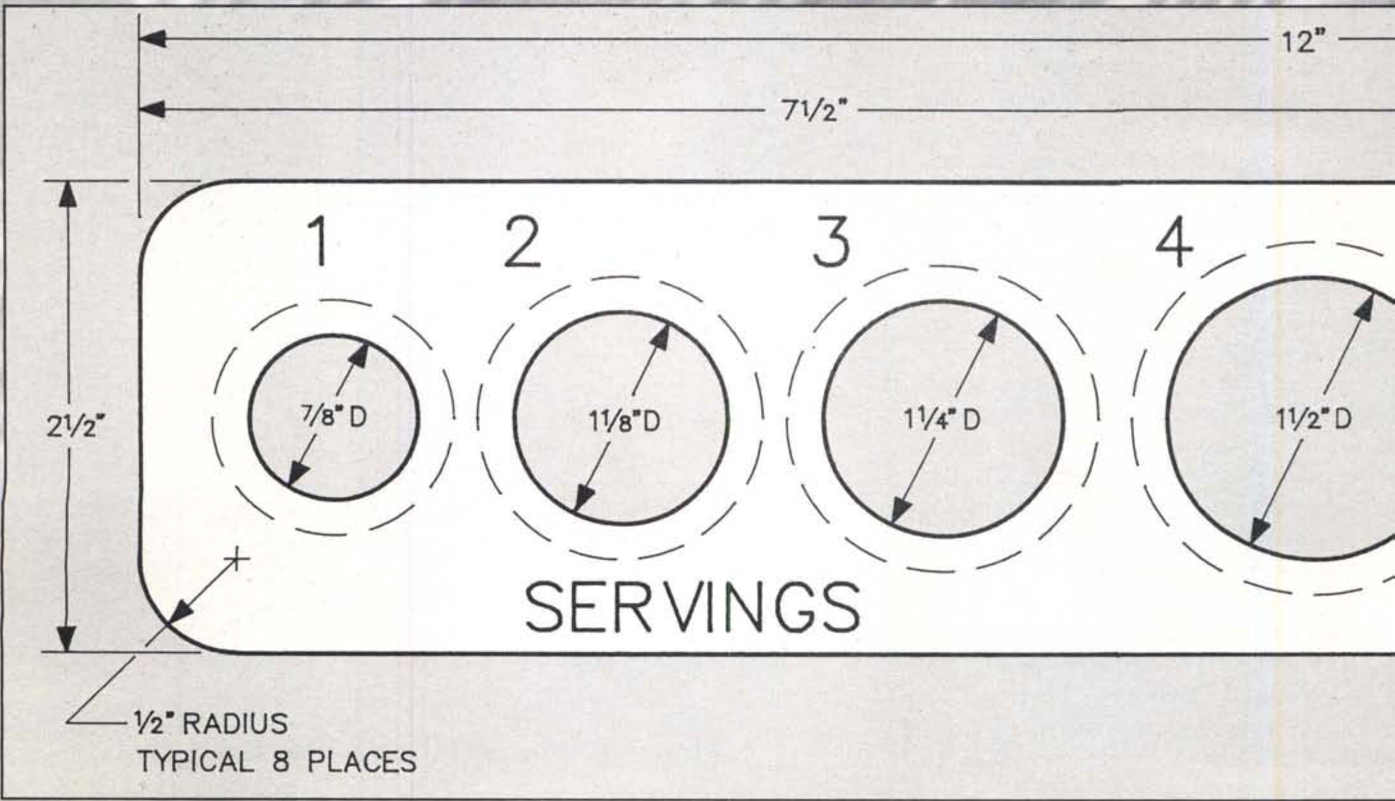
If you are the kind of woodworker who makes a lot of items for gifts, here is a simple and practical little kitchen item that will let you use up some of your wood scraps. These sell well at craft shows, too.

You can make spaghetti measures from any type of wood. A thickness of 1/2" seems best to me, but they could be thicker or thinner. Start by cutting the blanks to width and length. Next, drill the holes to the sizes shown. When boring the holes, it's best to drill halfway through from each side to avoid splintering when the bit breaks through. I use counterbores for boring the holes, but other bits, such as spade bits or hole saws, will work just fine. Now cut the handle outline and round the corners as shown. After sanding to the outline, I round all the corners and the edges of the holes with a 1/4" radius bit in a router.

For the lettering I used a steel stamp set, something which is available from most mail–order tool companies. To make the letters and numbers stand out and be more legible, trace the indentations with a sharp, soft lead pencil.

Since the spaghetti measure will be in contact with food (though very slight), a non–toxic finish (such as Behlen's Salad Bowl Finish, available from Woodcraft Supply Corp., Dept. PW–128, 41 Atlantic Avenue, Box 4000, Woburn, MA 01888) is a good choice to finish it with. PW

***Devore O. Burch** is a woodworker in Fort Worth, Texas.*



David Camp

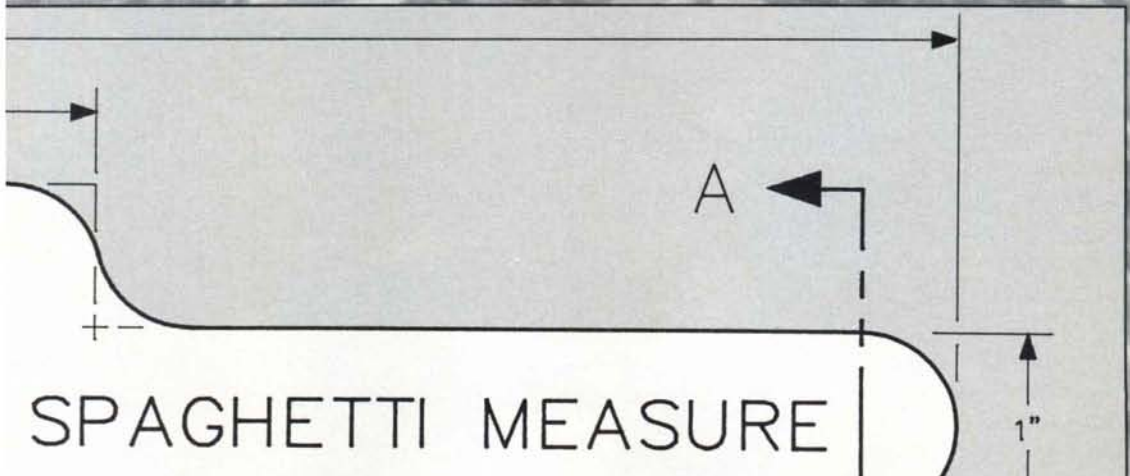
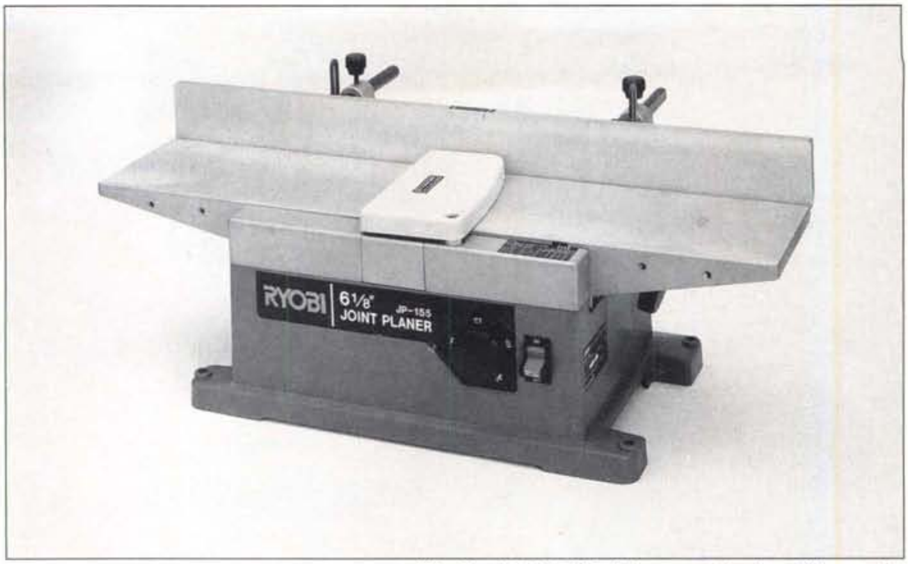


Illustration by Tom Larson

The 1988 National Hardware Show

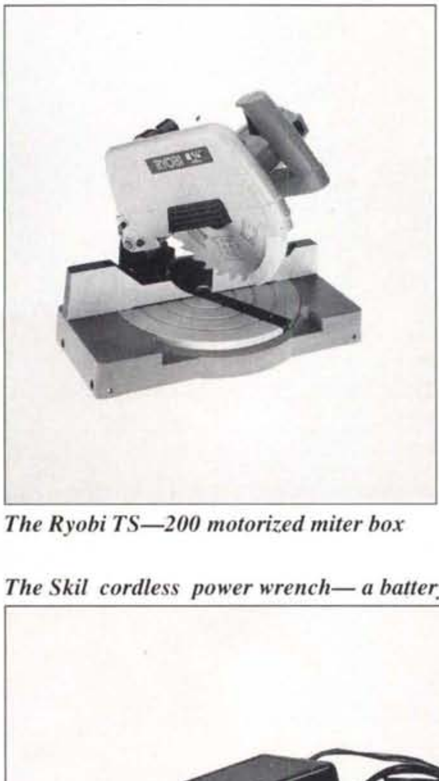
by Hugh Foster

Popular Woodworking editor David Camp flew east to join me at this year's National Hardware Show in Chicago. Our day at the show began early at the Ryobi "Breakfast Club and Magic Show." In most entertaining and delicious fashion, Ryobi fed us (too well!) and introduced a variety of new products, notable among them the JP–155 6-1/8" jointer powered by a variable–speed motor and a 3–horsepower, 1/2" collet router with electronic speed control. These new tools boast features that are sure to set the standard for future designers. Another most interesting addition to their line is the 14–pound TS–200 motorized miter box which should appeal to those who have to bring the tool to the job rather than the job to the tool.



The Ryobi JP–155 jointer weighs just 30 pounds.

Porter–Cable showed many new products, most notable among them was their *Tru–Match*™ edge–joining system. This stepped router base attachment and special bit cuts glue joints with perfectly aligning top surfaces. Edges joined with this setup are stronger than plain old square edge–joining (with 30% more gluing surface) and better–aligned because of the interlocking nature of the joint. Porter–Cable's other noteworthy innovation is a series of cordless tools made with *Magnequench*™ rare earth magnet motors; this is a fine demonstration of the next step in the evolution of power tools which seem to be becoming increasingly compact and portable as more and more of them become cordless.



The Ryobi TS—200 motorized miter box

The Porter Cable Tru-Match ™ edge–joining system uses special bits to cut joints.

Skil, too, is breaking new ground in cordless tools. In the next model year they will introduce a solar battery charger to accessorize their popular *Skil Twist*™. I believe this is the first tool to be *truly* all the way cordless. Innovation is a big deal at Skil; less than 15% of their 1981 line is still in production. They've introduced 51 new tools in the past three years, and two–thirds of these are mid–priced items for the do–it–yourself market. David, who had been tinkering with his truck shortly before the show, found the new "cordless wrench" to be one of the most interesting items in their new line–up. Perhaps of more interest to woodworkers is Skil's new plunge router; selling in the

The Skil cordless power wrench— a battery-operated 3/8" ratchet driver

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***Hugh Foster** is an English–teaching woodworker in Manitowoc, Wisconsin.*

"under $80" price range, this will be the least expensive plunge router on the market, and its features have been very carefully engineered. It is the only router I know of to feature bit storage in the handle and, more importantly, *wrench storage* on top of the tool.

Freud also has introduced a new plunge router that is quieter than much of the competition, a most interesting new router table, and a collection of router bits that is sure to empty the pockets of this wood–writer. The shapes of these new bits are so varied and so interesting that it's impossible for me to pick just one or two to mention here, but if you're listening, Santa—one of each of these would be just right. David was rather more interested in Freud's new thin–kerf saw blade. This 60–tooth blade cut so sharply that it wouldn't "creep" when the operator let go of the radial–arm saw handle, and its cut was so smooth that even ripped boards appeared almost to have been planed. Barry Dunsmore of Freud advised us that if we weren't sufficiently impressed, an 80–tooth version will shortly follow this one to market. Need I add, we were impressed.

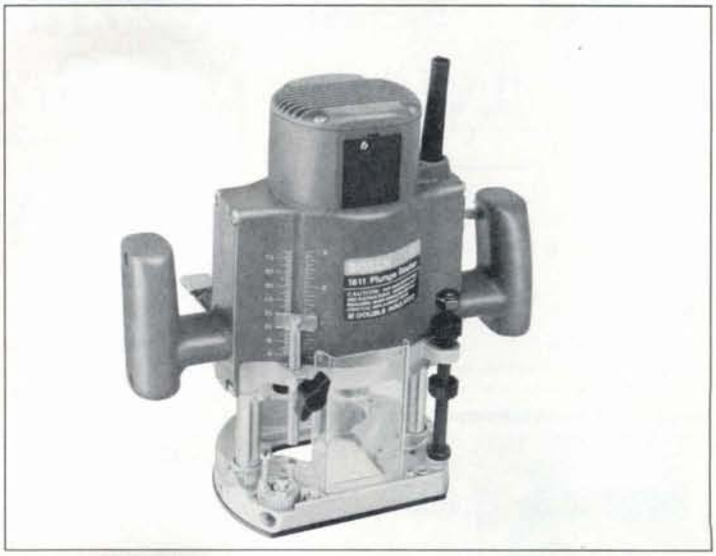
So far I've mentioned several routers. The highlight at Bosch in 1988 is their model 1611 variable speed 240–volt plunge router. Should you get an opportunity to turn this machine on, be sure to hold it in both hands—its power is absolutely breathtaking!

Makita is about to enter the portable surface–planer market; their small unit will plane 12" wide boards, in contrast to the 10" of most other portable surface–planers. Of more immediate interest to us was their new cordless reciprocating saw; quiet and powerful, this handy unit will find lots of work in remodeling projects, tree–pruning, and the like.

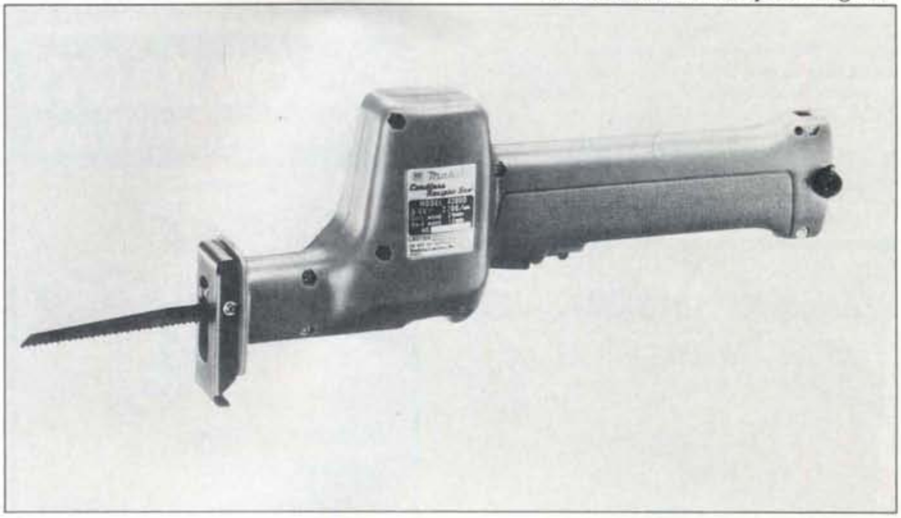
There are innovations in hand tools as well as power tools; DMT has introduced relatively inexpensive fold–up diamond hones in round, half–round, and flat configurations. Since these come in fine, coarse, and extra–coarse grits, my only problem in buying them will be deciding which to buy first. General Hardware is showing a new fly–cutter with a reversible blade that will cut either holes (as fly–cutters always have) or circles, depending upon how the user positions the blade.

As I reported last year, no one will ever give you a full report of this show. I'm not sure we saw even two percent of the total show in the 19–hour "work" day, but what we saw was impressive indeed. Your hardware merchant will soon have lots of these new "goodies" to captivate your hearts and empty your wallets. **PW**

The Bosch 1611 variable–speed plunge router with 3hp and 240 volts is a high-powered machine.

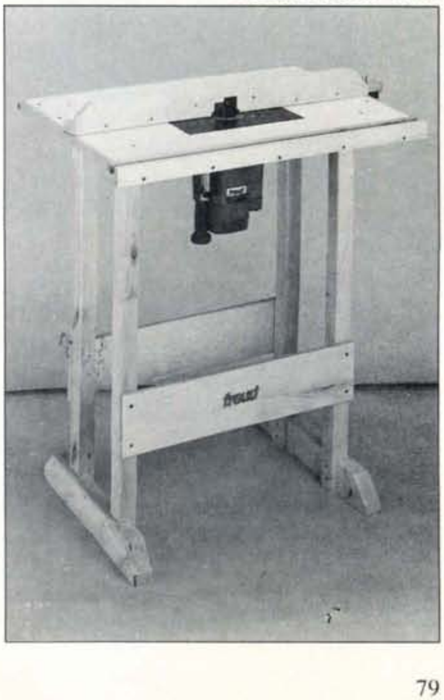


Makita's cordless reciprocating saw



The Skil model 1835 plunge router

Freud's router table



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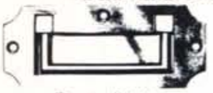

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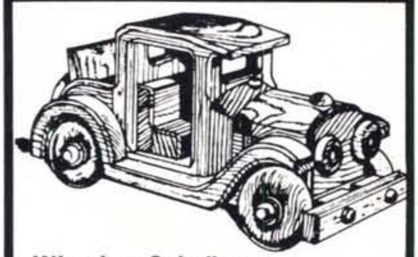

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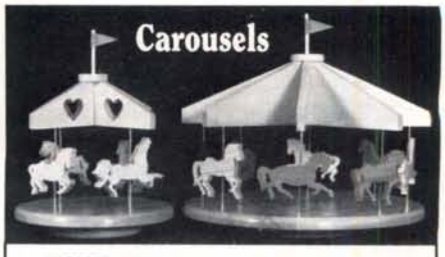

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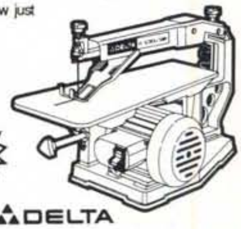

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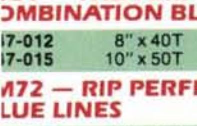

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Calendar

Events of Interest to Woodworkers . . .

If your group is having an event you would like other woodworkers to hear about, please send us all pertinent information at least three months before the opening date. We will publish it for you in "Calendar" free of charge.

November 17-December 31, Seattle, WA
The Northwest Gallery of Fine Woodworking will present its 8th annual "Box Competition and Container Show." Entries are juried for cash prizes and should be made of wood and open in some manner. To receive an entry form contact: Cheryl Peterson, Northwest Gallery of Fine Woodworking, 202 First Avenue South, Seattle, WA 98104 (206) 625-0542.

December 2-4, Syracuse, NY
The "Christmas '88 Art & Craft Spectacular" will be held at the New York State Fairgrounds, Syracuse, NY, with demonstrations by 200 professional artisans. Showtimes are: Friday 12/2 - Noon to 9 pm, Saturday 12/3 - 10 am to 7 pm, and Sunday 12/4 - 10 am to 6 pm. For more information contact: United Craft Enterprises, Box 326, Masonville, NY 13804 (607) 265-3230.

January 5-29, Seattle ,WA
"For The Office," a show of decorative wood art work for the office, will be presented by the Northwest Gallery of Fine Woodworking. Desks, desk accessories, chairs, and more will be featured by Northwest woodworkers. For more information contact: Northwest Gallery of Fine Woodworking, 202 First Avenue South, Seattle, WA 98104, (206) 625-0542.

January 6-8, Norfolk, VA
The Woodworking Association of North America's Virginia Show will be held at the Norfolk Scope, Norfolk, Virginia on January 6-8, 1989. Admission is $3.00 for WANA members, $6.00 for the general public, and free for those under 12. For more information contact: WANA, P.O. Box 706, Plymouth, NH, 03264 Tel. 1-(800) 521-7623 or (603) 536-3768.

January 13-15, Columbus, OH
The Woodworking Association of North America's Columbus Show will be held at theVeteran's Memorial Hall, Columbus, Ohio on January 13-15, 1989. Admission is $3.00 for WANA members, $6.00 for the general public, and free for those under 12. For more information contact: WANA, P.O. Box 706, Plymouth, NH, 03264 Tel. 1-(800) 521-7623 or (603) 536-3768.

January 16-18, King of Prussia, PA
SKF's Bearing Maintenance Institute will conduct ten " Industrial Maintenance and Service" courses at its King of Prussia, PA headquarters in 1989. The three-day courses teach how to save time and money by reducing premature bearing failure. Course dates in January are the 16th-18th; attendance is limited to 40 students per class. For more information contact: Raymond A. Guyer, Jr., SKF Bearing Services Co., 1100 First Ave., King of Prussia, PA 19406-1352. Phone (215) 962-4804.

February 16, Racine, WI
The Dremel Creative Scholarship Contest in sculpture, carving and woodworking is open to high school students from throughout the U.S. Entries are received in two categories: Junior Woodworking and Junior Carved or Decorated Projects, and Senior Woodworking and Senior Carved or Decorated Projects. Cash prizes up to $500 are awarded and the winner's schools receive a number of Dremel power tools for use in shop courses. The entry deadline for the 1989 contest is February 16th. Entry forms can be obtained by writing to: Dremel Creative Scholarship Contest, 4915 21st St., Racine, WI 53406.

April 13-23, Houston, TX
The 1989 Houston International Festival is now accepting applications from all artists interested in participating in the juried Arts and Crafts Exposition and Markets. The fair is a nationally promoted exhibit accepting entries in all contemporary and traditional crafts. The three outdoor markets are non-juried attractions, and accept entries in specific categories, (African, Latin, and Gypsy). Deadline for the Juried Exposition is **December 15, 1988,** and deadline for the Festival Market is **February 15, 1989.** For more information contact: Production Director, Houston International Festival, 909 Fannin, Suite 890, Houston, TX 77010 (713) 654-8808. **PW**

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North Texas	Feb. 17-18-19	Dallas Convention Center
Greater Milwaukee	Mar. 3-4-5	MECCA Convention Center
Metro-Richmond	Mar.10-11-12	Richmond Centre
Arizona	Mar. 17-18-19	Phoenix Civic Plaza
No. California	Mar. 31-Apr. 2	Santa Clara Convention Center
So. California	Apr. 7-8-9	Los Angeles Convention Center
Tennessee	Apr. 14-15-16	Nashville Convention Center
New England	Apr. 21-22-23	Hartford Civic Center
Chicagoland	Apr. 28-29-30	Odeum, Villa Park/Chicago
Greater Cleveland	May 5-6-7	Cleveland Convention Center

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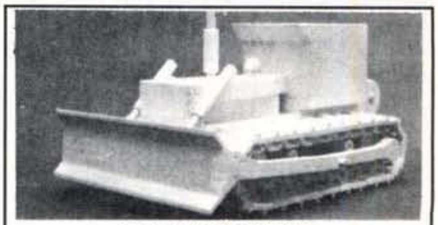

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Out of the Woodwork

by Jeff Taylor

Tale of a Sale

Standing outside my shop, my wife cradles a clipboard for listing the sacrifices in the newspaper. Yard Sale Fever: When the madness is upon her, she starts counting my few tools, dooming them each with words like "excess" and "surplus." Her normally clear blue eyes scan the shop and see, somehow, only clutter and crowding.

"How can you even walk in there?" she asks, frowning at the irreplaceable treasures heaped all around me. "You look like a mountain goat standing on a pop bottle." True enough, the only visible floor is between my shoes, and the Wonderful Things cover every other square inch. But heck, how much floor do I need? Who paces worriedly in their shop, anyway?

Then, out of the blue, she asks how many drills I own.

Let's see. The three shoulder drills, the seven push drills, the half-inch, the three-eighths, the quarter-inch, the modeling drills, the duckbill, and the nine bitbraces.

"Two," I say. "I could sell one, maybe."

She pouts. She says that I would no doubt sell her before I'd sell a tool; I say, oh nonsense, if I had a spare wife I'd want to keep them both. Somehow it comes out different than my meaning. Free advice: In marriage, surrender is the better part of valor. "Give me a table," I shrug. "I'll see if I can find a few things."

The sun rises on the awful day, baking our huge lawn which now looks like the floor of my shop. A hot day in Death Valley, so I put some beer on ice nearby. Then I lay each tool out on the table, stifling little cries of pain as I do.

Goodby, offset backsaw. So long, rosewood bevel square. Farewell, 45° bitbrace with the pearl-inlaid handles; my old punch router, several cordless hammers, a scratch awl. It would be easier, in some ways, to sell organs right out of my body. A beer helps. So does another.

Smelling the rotting bargains, vultures begin to pull up in their cars.

No, I'm wrong. This first guy is a walrus, wearing whiskers, a beret, and Army boots. His walrus spine has probably never felt the burden of a day's labor. His uncalloused flippers touch, and then pick up a plumb bob. "How much?" he asks, smiling sleepily and belching a little herring burp.

"Two hundred dollars," I say firmly. A fraction of its sentimental value, solid brass, steel tip, dated 1891. He opens his mouth, blinks rapidly by way of reply, puts it down and goes away, harrumphing. His place is instantly taken by a matron whose hair bounces and crackles, sprayed into tight little curls like Medusa's snakes. Thank my luck, she does not make eye contact as she grabs each tool and shakes it.

Finally she skewers me with a look. Her eyes are like black olives, salty and pitted. "What's this?" she asks, strangling a saw clamp used by better men than any of the seven husbands she has probably nagged to death. Her lips are hard enough to open a beer bottle, but I use my churchkey to open my next one.

"Don't know," I say absently, watching a small child experimentally poking his sister with my third-favorite awl. "I think it must be a Roto Rooter claw; I found it in a sewer cleanout all covered with...." She vanishes, wiping her hand on a lace handkerchief. I snatch the awl back from the kid and direct him to the toy section. While he's thus distracted, his sister punches him in the arm; they go away.

A young person coasts up magically from the sidewalk, wearing a wide skateboard on his feet. He stops, kicks one edge, and it springs into his hand. Chewing a large cud of pink gum, he sneers at the array of precious tools for performing the strange adult ritual called "work."

"Wow," he says. "Whoa, what a bunch of junk, dude! What are they all, anyway?" The scratch awl in my hand quivers. I breathe through my nose for a few seconds, and put it down.

"Deadly weapons," I say.

He ignores me. "Huh, wow, yeah. Got like, y'know, a wrench for tightening the nut on my wheels, dude?"

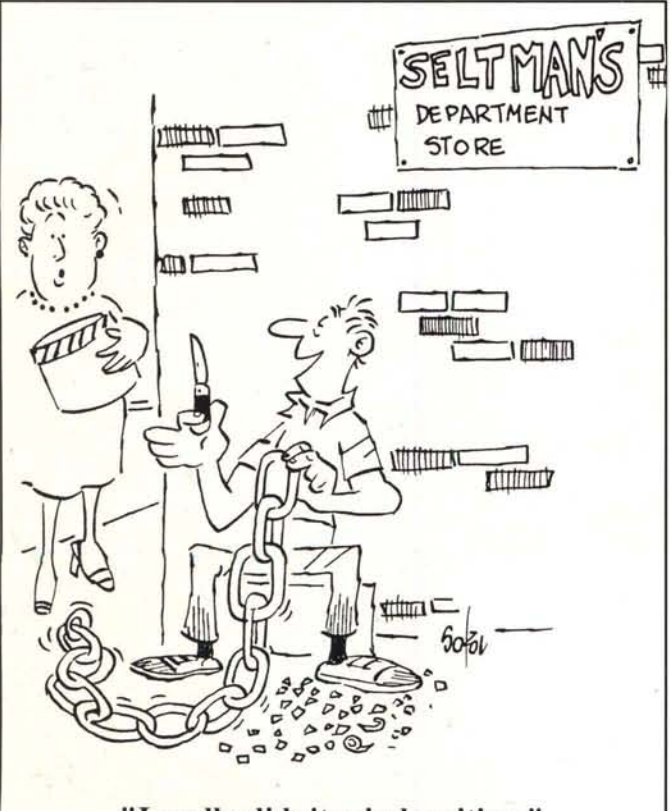
As it happens, I do have a tool for tightening up a little nut on wheels. "Maybe," I say. "Let me see your board." He starts to hand it over, but yanks it back when I pick up a froe. "Wow," he says again, "no way, man! You're sick!" I laugh and take a sip of beer. "You could always shoplift another one," I chuckle.

He goes away, pumping one leg and looking over his shoulder. Too bad. I could have customized it for him so he could drive it through a picket fence.

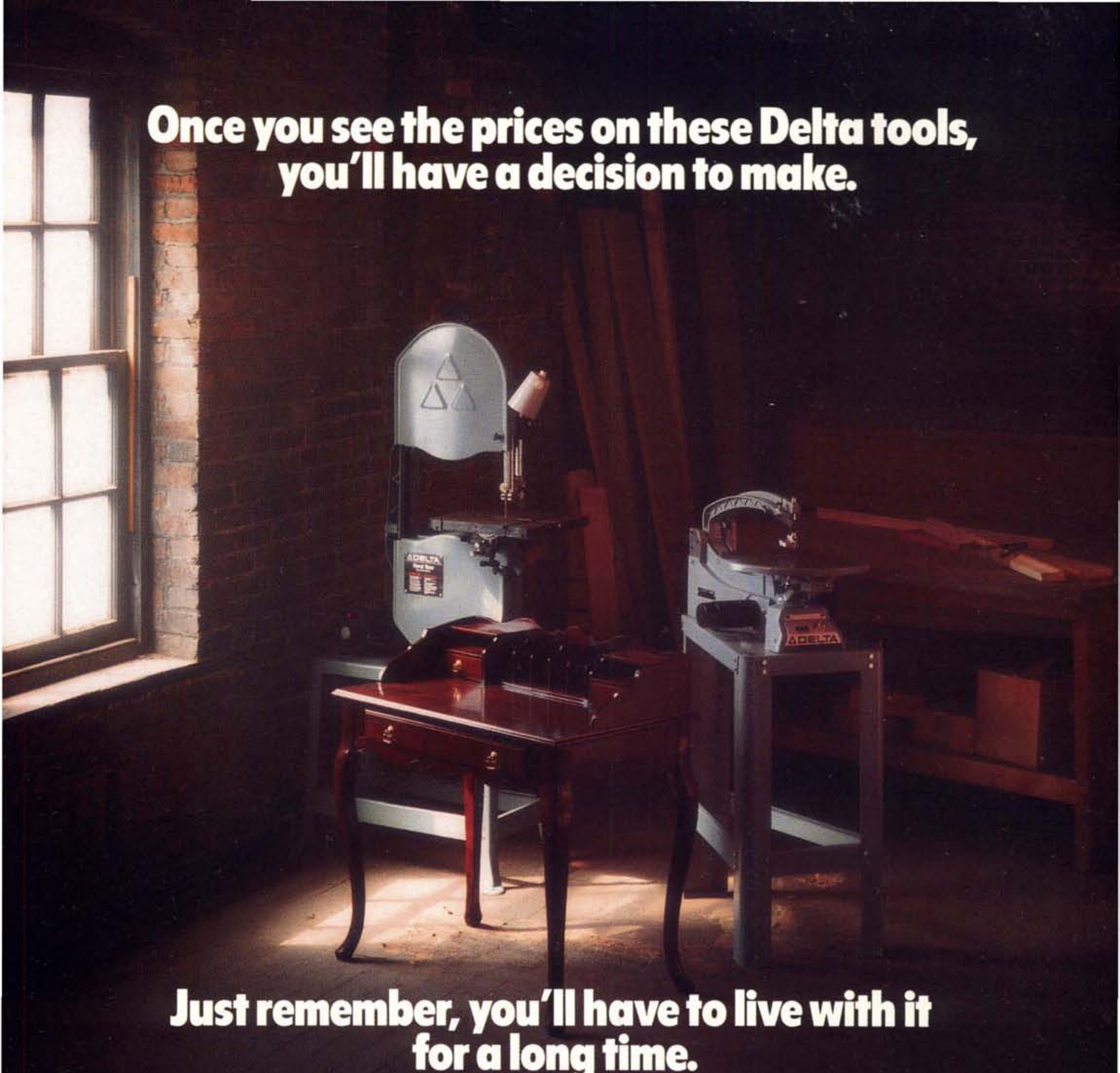
My wife comes up. "How's it going, honey?" Across the yard, somebody shouts an offer of five bucks for our grand piano. She smiles and shakes her head, holding out for six.

"Sell anything?" she asks me. I forget what I say. What I'm thinking, though, is: ***Not if I can help it!*** PW

Jeff Taylor is a woodworker and writer in Corvalis, Oregon.



"I really didn't mind waiting."

Once you see the prices on these Delta tools, you'll have a decision to make.

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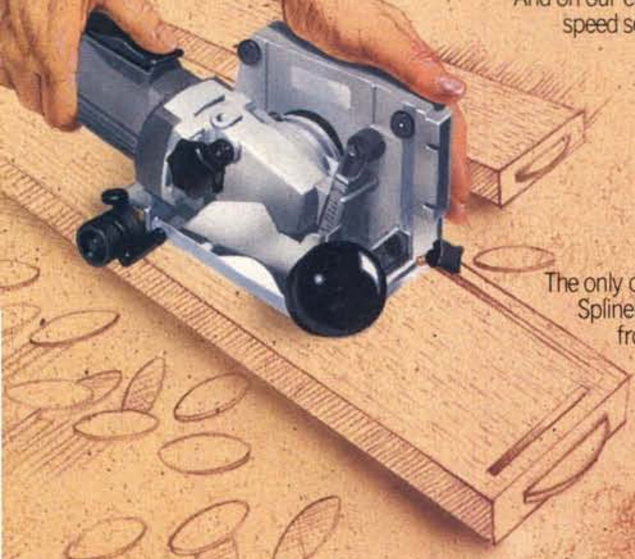

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